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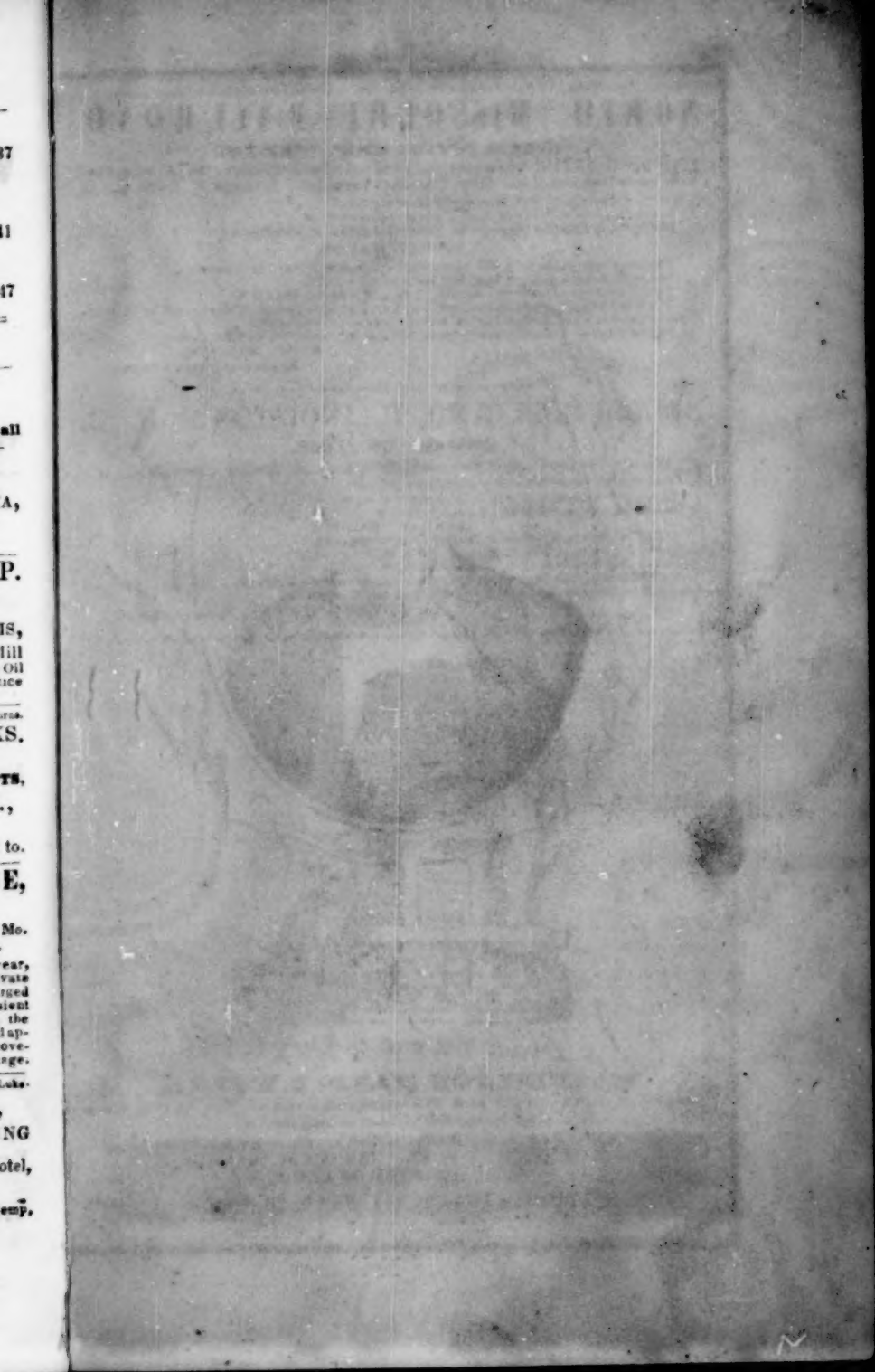

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Yours truly
John Reynolds

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THE

WESTERN JOURNAL

and Civilian.

VOL. XV. January, 1855. 2.

ARTICLE I.

Central America.

Central America, when viewed in all its aspects and relations, may be regarded as one of the most interesting divisions of the whole earth.

The ruins of cities, palaces and temples, which are found in that region, attest a social condition of its ancient inhabitants which must have been far removed from a savage state. Whether the order of civilization which once existed there had reached its full development and had decayed before the discovery of this continent by Columbus, or whether it was crushed and utterly destroyed by the Spanish conquerors, are problems which will perhaps remain forever unsolved.

When we contemplate the principal natural divisions of the globe, and take into view the geographical arrangement of the several continents and oceans, we observe a striking similarity in the relative positions of Central America and of Egypt; and though we know but little of the character of the more ancient inhabitants of either country, yet, there is much significance in the fact that in the old world the arts of civilization were first developed, chiefly, in the valley of the Nile, and in America, on the isthmus connecting the two great divisions of this continent. These facts, when considered in connection with the present condition of the two countries, suggest a train of reflections of the most grave and interesting nature.

Why has darkness so long prevailed over those regions where the lights of civilization first dawned upon the human mind? The fertilizing waters of the Nile still bring their annual tribute to the

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land of the Pharaohs; but the artificial canals, lakes, and machinery, by which in ancient times those waters were distributed—like the cities and temples of the valley—are in ruins. Egypt has ceased to be the granary of nations and the cradle of science; its present inhabitants, dwelling amidst the monuments, and trampling upon the ruins of its former grandeur, constitute a picture so dreary, so mysterious, and withal, so suggestive of the transitory nature of human institutions, that we instinctively turn from it with a sense of awe and humiliation.

But the history of Central America is indeed a sealed book: here a people have existed who drew their subsistence from the soil, who reared dwellings, temples and palaces of the most durable material, who cultivated the fine arts, and doubtless enjoyed all the luxuries which a tropical climate could afford. Where did they come from, how long did they exist, and what became of them? We ask in vain, for even tradition is silent.

The European order of civilization introduced into this region by the Spaniards, some three hundred years ago, seems destined to share a fate similar to that of its ancient inhabitants; and it is natural that the more enlightened and enterprising nations should take a lively interest in the changes which must occur in the social condition of that portion of the continent inhabited by the Spanish race.

We do not sympathise with modern *filibustering;* but there are natural laws impelling mankind to fulfill the injunction to multiply and replenish the earth, and subdue it. It is in vain for a people claiming a country the natural resources of which they will not or cannot develop, to insist upon their right to exclude all others from its enjoyment. Such claim is opposed to the principles of natural justice, and must yield sooner or later to the operation of natural laws. Movements have already been made which indicate important changes in Central America, and we conclude that the time is near when a new order of things will be established in that country.

There can be no donbt of the policy which the United States ought to pursue respecting this subject: while we strictly observe the laws of neutrality, and prevent the equipment and departure of warlike expeditions to interfere in the affairs of Central America, we should, on the other hand, as firmly resist all interference by European nations. A series of events have occurred calculated to attract emigrants to that country, and already the current of emi-

gration has commenced flowing in that direction. This movement is in obedience to natural laws; the time is ripe, and no power, acting in accordance with the usages of civilized nations, can, nor should, prevent the settlement of Central America by an efficient race of men which will develop its resources.

But the opinion is entertained by some, that the nature of the climate in Central America will not admit of its being inhabited, and brought into a state of profitable cultivation: we conclude that the correctness of this opinion will depend chiefly upon the character of the political and social institutions which may be established there. We do not believe that any country lying within the tropics, unless it be elevated table land, can be reduced to a state of cultivation, and be made productive and prosperous for an indefinite period by the labor of white men alone. Central America is the home of the black race, and it will require their labor, governed and directed by the intelligence of white men, to develop its resources. Under institutions similar to those existing in our Southern States, it would become the richest and most desirable portion of all the region embraced within the tropics. Owing to the great elevation of portions of the country, it affords the temperature of almost every climate, and no part of the earth is more advantageously situated in respect to commerce.

The foregoing observations have reference to the whole of that region lying between Tehuantepec, in latitude 18° N., and South America, including the Isthmus of Panama. The civil division known as Central America, is described by Macgregor, a British author, as extending from about 8° to 18° north latitude, and lying between 82° 30′ and 94° west longitude, between Cape Gracios a Dios, on the Caribbean sea, and Point Cosiguina, on the Pacific ocean.

Macgregor says: "The area, estimated by Humboldt, in 1822, was about 125,550 square miles. This calculation was made according to the then existing charts, which were discovered afterwards, by the surveys directed by the British Admiralty, to have laid down the east coast south of Cape Gracios a Deos more than thirty miles too far east. The area, therefore, may be more properly estimated at about 120,000 square miles; nearly equal to that of the United Kingdom. This area includes the Musquito Territory. On the north it is bounded by the States of Mexico and Balize, on the south-east by New Granada, on the east by the Atlantic, and on the west by the Pacific.

"This extensive region is remarkably irregular in its configuration. Mountains, elevated plains, ravines, lakes, rivers, bays, harbors, lagoons, forests and low lands are its predominating features.

"There are numerous fertile valleys, and the plateaux or table-lands, which are, however, but imperfectly known, are described as generally fertile. The mountain elevations rise from 5,000 to 13,000 feet above the sea. Many of them, if not the whole, are of volcanic formation. The country has been frequently disturbed by earthquakes.

"Its soil, its climate, and its productions, are as varied as its configuration. Its low lands, both on the Atlantic and the Pacific coasts, are considered remarkably unhealthy.

"CLIMATE.—It freezes sometimes during the night on the highest part of the table lands, in November, December and January. At the city of Guatemala, situated in the mean height of the table land, (4,961 above the sea,) the dry season begins towards the close of the month of October, and lasts till the end of May: during which time only a few showers occasionally fall. In the beginning of June, thunder storms become frequent, and are followed by heavy rains. From 6 o'clock in the morning till 3 or 4 o'clock in the afternoon, the sky is generally without clouds, and the air clear and refreshing. About the middle of October, the north winds blow, and the rains cease. The absence of either the windy or rainy seasons is accompanied by thunder; and, it is said, with slight shocks of earthquake. In March and April the thermometer sometimes rises to 86°. It generally ranges between 74° and 82° in the middle of the day. In December and January, when the north winds sometimes blow with great force, the thermometer varies between 68° and 72°. During the summer heat, it rises at about 7 o'clock in the morning to between 60° and 67°, and in the evening at the same hour to 67° and 68°; in winter it falls in the morning to 60° and 58°, and sometimes even to 56°; but in the evening only to between 60° and 64°. Towards the end of the dry season, the trees shed their leaves, and in many places vegetation appears suspended. The region in which the capital stands, is considered healthy; *goitres* are frequent in the high and mountain districts, especially among the mixed races.

"On the sea coast of the Pacific, the seasons correspond with those of the table lands, but the temperature is much hotter. It is said that the Pacific shores are healthy, although they are almost entirely covered with woods. This salubrity is, however, not without exceptional districts.

"The climate of the low eastern coasts is remarkably hot, and the seasons irregular. Below the table land it rains for a longer period than on the western shores, but the rains are not generally heavy. The rains and hot temperature render the climate in many parts unhealthy.

"POPULATION.—The inhabitants of Central America comprise three classes—whites, or Creoles of Spanish race, Mestizos, or the offspring of whites and Indians, and aboriginal natives. There are but few negroes, or Zambos. In the Department of Guatemala the Indian inhabitants are said to constitute the great majority of the people: in Costa Rica those of European race predominate; and in the three other Departments the Mestizos, mixed with a few mulattoes, prevail. Haefkens estimates the whole population at one million and a half, which he distributed as follows, viz.:—of European races, 125,000; mixed races, 500,000; Indians, 875,000; total, 1,500,000. But it is doubtful whether any approximate estimate can be formed. Many parts, as the inland parts of the Musquito Territory, the region bounding Yucatan, and part of Honduras, are very little known.

"The whites have monopolized nearly all the offices and dignities in the State, except under Carera, the present (1847) Indian ruler of the province of Guatemala. The handycraftsmen, shopkeepers and small tradesmen generally, are chiefly of mixed races. The aborigines are the principal inhabitants of the table lands.

"MINERALS.—Gold, silver and iron mines are worked; lead and mercury have been found. The most important gold and silver mines are those of Costa Rica, at Del Aquacate, and in Honduras, in Mount Merendon, between Chiquimula and the northern shores, and at Del Corpus and Tabanco. The iron mines are situated near Santa Anna; in Salvador 75,000 tons were said to have been produced annually; but these mines are nearly altogether, like most branches of industry, now neglected. This has been the natural consequence of the many revolutions and destructions which have disturbed the peace of the country. In Honduras, jasper and marble are worked. Brimstone is collected near the volcano of Quizaltenango. There are many salt springs, and salt is collected on the banks of some lagoons, as well as on the shore of the Pacific, in such quantities so as to constitute an article of commerce.

"FORESTS.—Dense forests of gigantic trees cover a great part of Central America. Among the most valuable products of these forests are mahagony, pimento, sarsaparilla, vanilla, and the black Peruvian balsam; the latter, only found in the district of Salvador, besides other drugs and gums; also the Brazil or Nicaragua wood, and many other beautiful and useful woods.

"The low country between the Pacific and the table lands and mountains, varies in breadth from thirty to fifty miles. A forest which covers all the plain, is remarkable for magnificent trees; some of them from thirty to thirty-five feet in circumference, and eighty to ninety feet in height: numerous creepers wind round their trunks to the height of forty or fifty feet. These forests consist chiefly of mahogany, cedar, Brazil, guaiacum, Santa Maria, and

other useful woods; vanilla, sarsaparilla, and other medical plants abound.

"WILD ANIMALS.—The wild animals, reptiles, and birds common to tropical South America, are found in Central America. Fish abound in the rivers and lakes, and along the shores of the east and west coasts. Alligators are also numerous in the Usumasinta and numerous rivers.

"LAKES.—Exclusive of the great lake of Nicaragua, there are many others; chiefly near the Pacific, and there are several lagoons, with sheltered entrances on the shores of the Caribbean sea. Caratasca Lagoon is forty miles long and more than ten broad. These lagoons are all separated from the sea by narrow and sandy ridges. "The lake of Nicaragua is described by Juarros as being more than 180 miles long from west to east, and nearly 100 broad from north to south, having almost everywhere a depth of ten fathoms, with a muddy bottom, except along the shore where there is clear sand. The city of Nicaragua is supplied with water from the lake, which also furnishes an inexhaustible abundance of fish. It is rendered extremely picturesque by numerous small islands with which the surface is studed; these are all uncultivated, except Ometep, which is inhabited. On this there is a lofty mountain of a conical shape, that is an active volcano, and frequently emits both flames and smoke. The lake itself is liable to tempestuous agitations, when the waves rise with violence, as they do in the open sea, under the impetus of a heavy gale. Although a great number of rivers fall into this basin, the river St. Juan is the only visible outlet. On the north, the district of Matagalpa, and many large farms for breeding cattle, border the lake; on the south are the city of Granada, and the town of Nicaragua; on the east the river St. Juan communicates with the Atlantic; and on the West is the lake of Managua, or Leon, which extends upwards of fifty miles in length by nearly thirty in breadth, and is connected by a canal with the Nicaragua."

Though the general description of these lakes may be regarded as correct, the dimensions given by Juarros are unquestionably too large. Mr. Baily says: "the lake (Nicaragua) is ninety-five miles long; in its broadest part, thirty, and averages fifteen fathoms of water."* O. W. Childs, Chief Engineer on the survey made for the *American, Atlantic and Pacific Canal Co.*, assumes the average length to be 110 miles by 25 miles in breadth. Mr. Childs found the whole fall from the surface of ordinary high water in

* Travels in Central America.

lake Nicaragua to the Pacific at the surface of the highest tide observed, to be 102 $\frac{9}{10}$ feet, and to the lowest tide 111 $\frac{47}{100}$ feet.

CITIES AND TOWNS.—The towns in Central America are generally represented to be in a decaying condition, and but little reliance is to be placed on the estimates respecting the number of their population.

New Guatemala, the capital of the State, is situated on a plain about 5,000 feet above the sea. The climate is represented as being similar to that of Italy, but not so cold in winter. Owing to the frequent occurrence of earthquakes in that region, the houses are built with thick walls, only one story high. Mr. Stephens describes the surrounding country in connection with a view of the city from a distant point, as "wonderfully grand and beautiful." The population of New Guatamala, including some adjacent places, was estimated, in 1847, at about 40,000 souls.

Old Guatamala, though destroyed by repeated earthquakes in 1773, still contains a population estimated at 15,000. There is perhaps no spot on the globe more picturesque, or more enchanting, than the country around this city. It is situated in a valley between two volcanos, 5,817 feet above the sea. The volcano del Agua is 12,620 feet above the sea, and the volcano del Fuego still higher. The first vomits water, the second fire: these are in full view of the city; but Mr. Stevens remarks that "the inhabitants, like the dwellers over the buried Herculaneum, seemed to entertain no fears of renewed disaster.

Leon is the capital of the State of Nicaragua; it was formerly a place of importance, with a population of 32,000, but has been greatly reduced by political disturbances. It is situated about ten miles from the Pacific coast.

Realejo, on the Pacific, has a capacious harbor, and is a place of some commercial importance, but it is a village of only two or three streets, with a few indifferent houses.

Granada, situated on the border of lake Nicaragua, is said to be in a decaying condition; some years ago the population was estimated at 14,000.

Nicaragua, situated about three miles from the lake, is said to contain about 10,000 inhabitants.

St. Salvador, Managua, Masaya, Valladolid, and some dozen other towns estimated to contain from 5,000 to 15,000 inhabitants each, are but little known by travellers.

AGRICULTURE.—Although situated within the tropics, yet, owing to the great elevation of a considerable portion of Central America, it is capable of producing almost every variety of plants and fruits which are cultivated on any part of the globe. Wheat, barley, and the fruits of Europe, are produced on the higher table-lands; but Indian corn is said to be raised and used as the principal article of food. In the lower lands most of the plants and fruits commonly grown in tropical climates, are cultivated. Sugar is raised on small plantations for home consumption, and small quantities are exported. It is said that coffee is but litile used by either the Spanish or native races in Central America and consequently little attention is given to its culture.

The modern improvements in agriculture have not yet been introduced into Central America, and the people of that region, like the Spanish race in Mexico, continue to use the same kind of implements which their ancestors brought with them from Spain.

THE MUSQUITO TERRITORY.—According to late maps, this territory extends along the coast of the Caribbean sea, from about 12° to 16° north latitude. It has no natural boundary on the west, and we are not aware that its exact area has ever been ascertained, or its limits certainly defined. It is generally conceded, we believe, by all who have examined the history of Spanish America, that this territory was never conquered by Spain. The Musquito Indians, possessing no artificial wealth, and subsisting chiefly upon the natural productions of the country, and, withal, being a brave and independent people, successfully resisted the Spanish invaders, retaining the possession of their country almost in its primitive state to the present time. The descriptions which have been given of this territory, are generally too vague to enable us to form a just opinion of its value; but enough is known to authorize the belief that it possesses great capacity for producing most of the leading staples of the tropics. Should the climate of this region be found congenial to a black population, we are persuaded that it will not be long before it will begin to draw a large amount of slave labor from the United States.

An account of the settlement of the Musquito Territory, and a description of its inhabitants, and of their political relations in respect to the Government of Great Britain, constitute an interesting chapter in the history of Central America. These subjects have been reviewed in two able papers, by John H. Tice, Esq., publish-

ed in the third volume of the "Western Journal," at pages 139 and 286.

It is one of the most remarkable facts in modern history, that Central America, a region so admirably adapted to the production of the great staples of commerce, so capable of yielding many of the luxuries which are highly valued by civilized nations, and withal, so conveniently situated, should, at this day, be but thinly inhabited by a people who look more to its natural productions than to agriculture for subsistence. This state of things cannot continue indefinitely: the wants of the human family require that the rich resources of Central America should be developed and distributed for the enjoyment of the civilized world, and men capable of producing this result, impelled by natural laws, will sooner or later possess the country.

Whether Central America is destined to be again, as it was in ancient times, the center of civilization upon this continent, is a question which time only can determine; but when we take into view the relative situations of the several continents on the globe, we are strongly impressed with the idea that, whatever may be the social character of its inhabitants, it will at some future day be the center of the world's commerce.

ARTICLE II.

(From the American Railway Times.)

Memoranda on Railways, prepared Office of Pacific Railroad Surveys,

BY CAPT. GEO. MC'CLELLAN, CORPS OF ENGINEERS, UNDER INSTRUCTIONS FROM HON. JEFFERSON DAVIS, SECRETARY OF WAR.

Continued from page 30.

CHARACTERISTICS AND COST OF SIX RAILWAYS.

1. *Massachusetts Western road.*

Length of main road, 155½ miles, of which 53 miles is double track; sidings, &c., 8½ miles: equivalent to 217 miles single track. Maximum grade, 83 feet for 1½ mile; total rise and fall, 2,085 feet; minimum radius of curvature, 882 feet; total degrees of curvature, 6,370°; weight of rail per yard, 56½ pounds and 70 pounds; 33 way stations, 59 engines, 48 passenger cars, 17 baggage cars, 1,666 freight cars; miles run in one year, 947,382.

Graduation and masonry, per mile of main road	$22,852 50
Wooden bridges, (6,092½ feet,) per foot	38 08
Superstructure, per mile of single track	7,343 78
Engineering, per mile of main road	1,105 74
Total cost of road in complete running order, per mile of main road	64,214 56
Total cost of road in running order, exclusive of land damages and stations, per mile of main road	60,042 52

Velocity of express trains, 35 miles; accommodation trains, 28 miles; freight trains, 15 miles per hour.

2. *Boston and Lowell railway.*

Length of road, 26 miles, all double track; branches, sidings, &c., 16¾ miles: equivalent to 68¾ miles single track. Maximum grade, 10 feet for 6¼ miles; total rise and fall, 190 feet; minimum radius of curvature, 1,975 feet; total degrees of curvature, 665°; weight of rail per yard, 56, 60, 63 pounds; 9 way stations, 22 engines, 22 passenger cars, 11 baggage cars, 308 freight cars; miles run in one year, 275,681.

Graduation and masonry, per mile of main road	$15,475 00
Wooden bridges, (2,397 feet,) per running foot	18 81
Superstructure, per mile of single track	4,967 60
Engineering, per mile of main road	1,632 35
Total cost of road, equipment, &c., in complete running order, per mile of main road	78,636 00
Total cost of road in running order, exclusive of land damages and stations, per mile of main road	39,090 34

On the road the land damages and cost of depots, stations, &c., were enormous. Velocity of express trains, 35 miles; accommodation, 25 miles; freight 12 miles per hour.

3. *Boston and Maine railway.*

Length of road, 74 miles, of which 46½ double track; branches, sidings, &c., 29½ miles: equivalent to 103½ miles single track. Maximum grade, 47⅓ feet for three fourths of a mile; total rise and fall, 1,498 feet; minimum radius of curvature, 1,050 feet; total degrees of curvature, 1,988°; weight of rail per yard, 56 and 60 pounds; 18 way stations; 28 engines; 35 passenger cars; 13 baggage cars; 585 freight cars; number of miles run in one year, 516,328.

Graduation and masonry per mile of main road	$11,920 00
Wooden bridges, (9,619 feet,) per foot	38 61
Superstructure, per mile of single track	9,517 67
Total cost, in complete running order, per mile of main road	55,558 71
Total cost in running order, exclusive of land damages, stations, &c., per mile of main road	38,525 78

Velocity of express trains, 36 miles per hour; velocity of accommodation trains, 24 miles per hour; velocity of freight trains, 11 miles per hour.

4. *Boston and Providence Railway.*

Length, 43½ miles, of which 15¾ double track: sidings, branches, &c., 19 miles: equivalent to 78¼ miles single track. Maximum grade, 37½ feet; total rise and fall, 505 feet; minimum radius of curvature, 1,910 feet; total degrees of curvature, 342°; weight of rail per yard, 56 to 58 pounds; 26 way stations; 20 engines; 31 passenger cars; 9 baggage cars; 125 freight cars; number of miles run in one year, 305,734.

Graduation and masonry, per mile, main road	$17,625 50
Wooden bridges, per running foot	32 00
Iron bridges, per running foot	40 00
Superstructure, per mile, single track	8,390 75
Engineering, per mile, main road	2,294 00
Total cost in complete running order, per mile, main road	81,273 00
Total cost in running order, deducting land damages, stations, &c., per mile, main road	57,397 00

Velocity of express trains, 34½ miles per hour; velocity of accommodation trains, 25 miles per hour; velocity of freight trains, 14 miles per hour.

5. *Vermont Central road.*

Length, 124 miles.

Graduation, per mile	$14,517 00
Masonry and bridges	6,599 00
Superstructure, per mile	8,594 00
Engineering	928 00
Total cost in complete running order, per mile	55,685 00
Total cost per mile, excluding land, stations, &c.	45,852 00

6. *New York Northern road—Ogdensburg.*

Length, 118 miles.

Grading and masonry, per mile	$15,567 00
Superstructure	9,545 00
Bridges	1,203 00
Engineering	1,099 00
Total cost per mile, in complete running order	40,005 00
Total cost per mile, exclusive of land, stations, &c.	34,810 00

Average of the six preceding roads.

Graduation and masonry, per mile	$17,343 00
Wooden bridges, per running foot	31 00
Iron bridges, per running foot	40 00
Superstructure, including iron, per mile, single track.	8,042 50
Engineering, per mile, main road	1,411 60

Total cost per mile, main road, in complete running order..... 62,561 00
Total cost per mile, main road, in running order, exclusive of land damages, stations, &c..... 46,619 00

Average of fifteen New England roads.

Engineering, per mile, of main road..... $1,041 00
Total cost, per mile of main road, exclusive of land damages, stations, &c..... 36,395 00

The average of 36 Massachusetts roads gives as the velocity of passenger trains 23.8 miles per hour, and as the velocity of freight trains 13 miles per hour; and the average cost per mile of 1,415 miles of road in the same State, as $43,659 85 per mile of main roads.

DEPOTS, ETC.

For a large depot of an important road an area of about 50 acres is necessary, to accommodate all the requisite shops, sheds, storehouses, &c.

For ordinary way stations, about 5 to 10 acres.

An engine-house for, say, 7 engines, costs, with turn-tables, about..... $3,500 00
A common way-station house, about..... 1,500 00

REPAIRS AND INSPECTION OF TRACK.

It is generally the case, on our roads, that one man carefully inspects about two miles of track every day. He makes all the small repairs that are necessary.

By the use of hand-cars, from five to ten miles of track could be daily inspected and repaired by one party.

TUNNELS.

"It is a rule which may be regarded as generally applicable, that to make a cutting more than sixty feet deep would be costlier than to 'bore,' unless the material is required for a neighboring embankment. Economy is the principal test in these matters; for in the present advanced stage of engineering, a tunnel may be made of almost any length, and through almost any substance, from granite rock to quicksand, and therefore the nature of the ground can hardly be said to oppose any other obstacle than that occasioned by the cost."

There is, however, an instance of an excavation 110 feet in depth in sand.

Shafts are usually sunk along the line of the tunnel at from 500 of 1,000 feet apart. On the Blaisy tunnel one shaft is 646 feet in depth; on the Nerthe tunnel one of 610 feet.

It is now a quite generally received opinion that shafts are not so necessary for the ventilation of the tunnel after its completion as was formerly supposed to be the case. Where it was proposed

to use machinery for excavating, a tunnel of 7.5 miles has been projected without the use of shafts.

Shafts are usually from 7 to 11 feet in diameter.

The largest tunnel of which I can find a record is one in the district of Schemnitz, in Hungary. Its length is variously stated at from 10 to 11½ miles. It is used to drain an extensive series of mines, and also for the transportation of ore on railway cars.

The longest tunnel of large dimensions which I find recorded as having actually been completed is one in France. It is 3½ miles long, and a little more than 26 feet in diameter; 54 shafts were employed.

The section of railway tunnels varies considerably in different countries and on different roads. The dimensions of several will be found in the tables which follow.

Several machines for the excavation of tunnels have been invented. It does not appear that any of them have proved successful; so that in estimating the time necessary to construct any proposed tunnel, it will be safer to base the calculation upon the results of works actually completed.

As a general thing, headings, as they are called—small tunnels in fact—are first driven through, and afterwards enlarged, to form the large tunnel. This method of proceeding has great advantages in some localities, but is not always resorted to.

The grades can be so arranged in railway tunnels as to facilitate the drainage during the construction by establishing a summit in the middle of the tunnel, thus allowing the water to run out at each end without interfering with the work; there are instances of great embarrassment caused by the neglect of this simple precaution.

In France there are 56 tunnels on railways; eight canals, 36 of which have an aggregate length of 45.4 miles. The longest of small size is 7.45 miles, and that of large dimensions 3.5 miles. The Rouen and Havre road has eight tunnels; Paris and Lyons also eight.

The aqueduct from the Durance to Marseilles has three tunnels, whose aggregate length is 10.5 miles.

That through the Taillades had 7,320 gallons of water pumped out per minute during a part of the time it was under construction.

The Nerthe tunnel, near Marseilles, is 15,153 feet long; has twenty-four shafts, whose aggregate length is 7,289 feet—the deepest being 610 feet. It is in very hard limestone rock; is 29½ feet high by 26¼ feet wide. The shafts are lined with masonry; a portion of the body of the tunnel is lined with masonry, one, two, and three bricks thick; another portion is not lined at all. A semicircular brick aqueduct, 4½ inches in diameter, runs the whole length of the tunnel under the floor. The time occupied in the construction is not stated.

The cost of the Nerthe tunnel was as follows:

For mining the body of the tunnel.....$705,982.20

For mining the shafts	109,081 08
Masonry for the shafts	49,069 31
Lining for the body of the tunnel	423,711 18
Cost of aqueduct	10,607 10
Total cost of the tunnel	$1,298,450 87

The average cost of excavating the shafts, which are nine feet ten inches in clear diameter, was $43 per yard down; the average cost of the lining of the shafts was $19 40 per yard down. The deepest shaft cost, on the average, $73 per yard down, completed.

Cost of mining the body of the tunnel, $319 76½ per running yard.

On the German railways are ten tunnels.

The great "gallerie d'ecoulement" of the Clausthal mines, through the Hartz mountains, is 6.5 miles long. It was commenced in 1777 and completed in 1800, (twenty three years,) and cost a little more than $350,000. Some authorities state this tunnel to be 7.5 miles long. Its dimensions are not given, but it is probably small.

In Sardinia there is a tunnel two miles long, through Mt. Giovi, on the Genoa and Turin railway. On this road, in 25 miles through the Appenines, are nine tunnels.

In Austria the Sommerung tunnel is one mile long.

England has 48 canal tunnels of an aggregate length of forty miles; the largest being over three miles, on the Huddersfield canal. She has also 79 railway tunnels; 49 of which amount to 33 miles, the longest being three miles.

The London and Birmingham railway has eight tunnels; London and Dover, five; Newcastle and Dover, five.

The Woodhead tunnel between Manchester and Sheffield, is a little more than three miles long. It has five shafts ten feet in diameter, which vary from 400 to 600 in depth. The character of the rock is granitic, being "mill-stone rock." The tunnel was about five years in construction, and its whole cost was $1,026,705.

Uppingham tunnel, 1,320 feet in length, cost $120 per lineal yard.

Saltwood tunnel, in very wet sand, cost $524 43 per lineal yard.

The United States has 67 tunnels on canals and railways, the longest of which is about one mile. Details are difficult to obtain. Many of them are short, however.

Baltimore and Ohio road has 16 tunnels; Parkersburg road, 17; Hempfield, 7.

The old canal tunnels cost, on an average, about $17 77 per running yard.

Those of ordinary size for railways cost from $88 per lineal yard, for those in soft sandstone not requiring a lining of masonry, to $444 and $710 per yard, in very loose ground, such as quicksand, &c., requiring a very thick lining.

Ordinary brick lining costs from $8 to $9 p. cub. yard, incl. center'g.

The shafts for the Blechingly tunnel, 10.5 feet in diameter, sunk in blue clay, and lined, cost $68 44 per yard down. The longest shaft is 97 feet.

Those of the Blaisy tunnel cost, lined, $139 11 per yard down. The soil was of clay, chalk, and loose earth. Deepest shaft 646 feet, and few less than 328 feet.

The cost of shafts varies in proportion to their depth, &c.

The cost of those in the Black Rock tunnel, Pennsylvania, in hard slate, was $79 50 per yard down, or 18 72 per cubic yard. The shafts were seven feet in diameter, and 139 feet deep.

The cost per cubic yard of excavating tunnels has been in the—

Black Rock, hard greywacke slate, [U. S.]	$6.60
Lehigh, very hard granite, [U. S.]	4.36
Schuylkill, slate, [U. S.]	2.00
Union, slate, [U. S.]	2.085
Blisworth, blue clay, lined, [Eng.]	1.545
Box, freestone, marble, clay, &c., lined, [Eng.]	3.464
Blaisy, exclusive of shafts, but including the lining, [France]	3.176
Blue Ridge, cost per cubic yard	4.000

The Blaisy tunnel cost, exclusive of shafts, $108 31 p. lineal foot.

In comparing the cost of tunnels in different countries, the difference of the price of labor should be considered. This has not been done in any of the examples here given; the actual cost in pounds sterling, &c., being simply reduced to dollars.

The time required to drive the heading of the Black Rock tunnel was 1,243 days, and 1,144 nights, or 2,387 spaces of 12 hours each, for 1,782.5 feet in length of tunnel.

For details of this tunnel, see the following tables.

In the Kilsby tunnel, a working shaft 129 feet deep, much troubled with water, was finished in seven or eight weeks.

In hard rock, where continual blasting is required, two expert miners can run a "branch" 40 inches by 32 inches to the length of 10.5 inches in 12 hours.

A tunnel cannot be pushed further than 500 feet without resorting to artificial means of ventilation.

Ventilation is found to be better in cold weather than in warm.

Headings are about 12 feet high; width at base, that of tunnel at that height.

In the table on the succeeding page,

P. L. means partly lined with masonry.–L. means lined with masonry.–N. L. means not lined with masonry.–Z. means not stated. S. means has shafts.—S. S. means supposed to have shafts.–C. means average depth.–a. means average per running foot taken from total cost.–D. means was constructed to drain the lakes in the valley of Mexico, to prevent overflows.

Measures are in feet and decimals; Time, in working days; Cost, in dollars and decimals.

Comparative Table of some of the largest Tunnels.

Name of Tunnel.		Date.	Formation.	Shafts	Maximum depth.	Section of tunnel.	Length in feet	Time required.	Cost p. lineal foot.	Total cost.	Locality.
					Feet.			Days	Dollars	Dollars.	
Nerthe	P. L.	Z.	Hard limestone	24	610	29.5 x26.25	15,153	....	.....	1,298,450	Near Marseilles, France.
Riqueval	P. L.	1803	Chalk	54	210	26.25x26.25	18,623	2,139	39.887	742,817	St. Quentin canal, France.
Pouilly	P. L.	1824	Chalk and clay	32	164	26.31x20.34	10,928	2,504	113 965	1,245,412	Bourgogne canal, France
Assohviller	Z.	1839	Z	S. S.	Z.	26.25x26.25	7,384	1,378	68.38	a. 504,897	Maine and Rhine canal, France
Mauvage	Z.	1840	Z	S	Z.	25.59x25.59	15,752	2,085	94.43	a.1,487,398	Maine and Rhine canal, France
Rolleboise	Z.	1841	Chalk	S. S	Z	24.94x24.94	8,670	626	62.98	546,099	Rouen Railway, France.
Roule	Z.	1841	Z	S S	Z.	24.94x24.94	5,645	522	62.98	355,513	Rouen railway, France.
Lioran	Z	1839	Z	S. S	Z.	21.33x21.33	4,548	2,087	56 98	259,178	National road, No. 126, France.
Kilsby	L	1834	Clay and sand	18	164	27 x23.50	7,233	1,252	194.31	1,405.417	London&Birmingh.railway,Eng
Blechingly	L.	1840	Blue clay	12	970	24 x25.05	3,972	626	102 86	423,271	London & Dover railway, Engl.
Thames & Medway	P. L.	1822	Chalk	S.	194	30 x28.7	11.880	939	45.59	541,550	Thames&Medway canal, Engl.
Box	P. L.	1837	Marble, freestone marle, &c	15	400	35 x39	9,680	1,252	148.15	1,434,063	Great Western railw.—shafts 25 ft. dia.. $\frac{1}{3}$ of tun. in rock, Eng
Hare Castle	L.	1824	Rock and sand.	15	187	14 x16	8,778	939	57.05	500,799	Trent & Mersey canal, England
Nochistongo (D)	L.	1807	Clay and marl	S.	164	13.78x11.48	21,659	287	.....	....	Lake Zumpango, Mex.; a Desagua
Blisworth	L.	1796	Rock and clay.	19	59	16.5 x18	9,240	2,191	23.185	214.229	G. J. canal, England.
Sapperton	P. L.	1789	Rock	S. S	246	15 x15	12,900	1,878	12 41	160.476	Thames& Severn canal, England
Black Rock	N. L.	1835	Greywacke slate.	6	139	19 x17 23	1 932	....	77.18	149,120	Reading,Pa., railway, United St
Blaisy	L.	1846	Chalk, clay, &c.	22	646	26.25x26.25	13,455	1,043	136 06	1,830.730	Paris and Lyons railway,France
Edge Hill	P. L.	1826	Clay and freestone	S.	Z.	22 x16	6,600	....	30.15	198,969	Liverpool&Manchester rail., En
Littlebourg	L.	1840	Z	14	(c)177	27.5 x24	8,607	590	129.61	1,115.544	Manchester&Leeds railway, En
Woodhead	Z.	Z.	Millstone rock.	5	600	....	15,840	1,800	.....	1,026,705	Manchester&Sheffield rail., Eng

A tunnel has been projected at Mt. Cenis, on the line of the Lyons and Turin railway, of the length of 7.6 miles; the gradient in the tunnel to be 105 feet to the mile; the section of the tunnel to be 19 by 25 feet; no shafts to be used. By the aid of machinery it was expected to complete this work in five years, at an expense of $2,615,000.

The inventor of the machine and the engineer of the road is the Chevalier Mause. His plans and estimates were submitted to, and approved by, a board of eminent engineers and geologists, among whom was the celebrated Mr. Robert Stevenson.

The tunnel projected through the Hoosack mountain was to have been 4½ miles long, 23 feet by 22 feet; two shafts about 850 feet and 750 feet deep, 10 feet in diameter. The cost variously estimated at from $2,000,000 to $3,000,000. Time estimated by different engineers at from four to ten years. The machinery designed for boring did not succeed, and the project has not as yet been commenced seriously.

At the crossing of the Blue Ridge by the Virginia Central railroad there are four tunnels. The main tunnel is 4,280 feet in length; has been four years in construction, and is estimated to require two years more to complete it. No shafts are used. It is ventilated by machinery. A portion of it is lined. It is for a single track, and is in the clear 21 feet high by 15 feet in width. Where lined, the abutments of the lining are 4 feet thick; the arches 3 feet thick. The excavation in these places is 26 feet high by 23 feet wide.

A portion of one of the small tunnels is through a very difficult formation of loose rock and earth. In the main tunnel much trouble is experienced from the water.

The main tunnel is 700 feet below the crest of the mountain through which it passes. The workmen are arranged in three reliefs, and working night and day. No machinery is used for boring or excavating. It is the opinion of the engineer that no machinery can be applied when the tunnel requires lining, for want of space. He states that no excavating machine has yet been successful.

SNOW.

The roads in Massachusetts, with rare exceptions, find little difficulty in clearing the track from snow in the course of one day. They only fail to do so when the snow drifts badly, and packs hard.

To open the road, from two to five engines are attached to each train, with a snow plough in front. The train pushes through until stopped, when it backs off and again advances.

Snow to the depth of five or six feet, as a maximum, can be cleared in this manner. With higher ploughs and additional power, it is possible that slightly greater depths of light snow may be worked through.

Snow a foot deep does not present a very great obstacle—that is to say, the train makes regular progress at reduced speed.

Embankments are far less obstructed than cuts.

Cuts of twenty feet deep, and upwards, are less obstructed than those of from five to ten feet.

Alongside of cuts like the latter, snow fences are used. These are board fences, about eight feet high, placed some twelve feet back from the edge of the excavation.

Drifting snow obstructs a train far more than a settled fall; for when the engine is brought to a state of rest, and finds it necessary to "back" in order to obtain a new impetus, the snow blows in under the wheels, and sometimes "blocks" the train so that it cannot move either way. In such cases a large manual force is necessary to clear all the wheels at once.

Men and shovels are always carried on the train when the fall of snow is great, in order partially to open heavy drifts and to provide for the contingency of the train being blocked.

Freight trains should be discontinued until the road is opened; the work being done by the passenger trains.

Light dry snow is by no means so serious an obstacle as wet heavy snow, except in regard to its liability to drift.

In opening the road over heavy gradients, commence working from the summit.

When the snow opposes a considerable resistance, the engines use about double the usual quantity of fuel and water.

Snow-ploughs are generally of two sizes; the larger sizes are from nine to ten feet high, and about seven feet broad; the smaller are about four feet high by seven feet broad, and are sometimes of iron.

FREIGHTS.

Average freights during the last eight years from Calcutta to Boston $15 per ton.

Average for same time from Calcutta to London $17 per ton.

From Canton to the United States $10 to $18.

From Canton to England $26 per ton.

From Shanghai to the United States $10 to $20 per ton.

From Shangai to England $26 to $30 per ton.

Freights from Boston to San Francisco average since 1849, $22 per ton; at present, $12 per ton.

Average freight from China and the East Indies to San Francisco $13 per ton.

Silks usually pay $5 per ton more than teas.

CATTLE, ETC.

The total number of live stock carried over the Baltimore and Ohio railway during the year ending September 30th, 1854, was 164,869, of which number 75,575 were transported a distance of 368 miles.

At the same rate of freight as on the Baltimore and Ohio road it would cost about $36 per head for horned cattle from Fort Smith to San Francisco, and about 42 per head from Memphis.

To transport horses and mules by railroad from Memphis to San Francisco, by way of Fort Smith, would cost about $47 per head.

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REPORT

Upon the Cost of Transporting Troops and Supplies to California, Oregon, New Mexico, &c., &c. By Major General Thomas S. Jesup, Quartermaster General, U. S. A.

SIR: In reply to your letter, dated the 8th instant, asking information in regard to transportation, I have the honor to report, in answer to the "1st. The present cost of transporting troops to San Francisco and Fort Vancouver, via the Isthmus, how much for each officer and soldier; stating whether the price includes their food, and, if not, what additional amount is paid for food, or the transportation of their rations and arms."—that the last troops sent to San Francisco, via the Isthmus, (in May, 1854,) their transportation was as follows: $225 for each commissioned officer; $150 for each enlisted soldier, laundress, &c.

The whole was subsisted by the contractor; 100 pounds of baggage allowed to each person on the steamers, and 25 pounds each across the Isthmus; all over the 25 pounds across the Isthmus to be paid for at 15 cents per pound. No troops have been sent from the Atlantic coast direct to Vancouver or Oregon, via the Isthmus. For those sent from San Francisco, California, to Vancouver or Oregon, in June, 1853, $75 was paid for each commissioned officer, and $40 for each enlisted soldier, &c., and $30 a ton for stores. In December, 1853, $15 a ton, and in February, 1854, $20 a ton, for stores.

From information received from New York, since the receipt of your letter, I learn that the company now demands $300 for each officer, and 150 for each enlisted soldier, from New Orleans to San Francisco, including the transit of the Isthmus—extra baggage to be paid for at 15 cents per pound.

To the "2d. What is the cost of the transportation of provisions, in bulk, to San Francisco and Fort Vancouver, via the Isthmus, and also via Cape Horn,"—I have to reports that no provisions or other public stores, in bulk, have been sent to San Francisco or Fort Vancouver, via the Isthmus; but from information just received from New York, I learn that the present charges by that route are $14 a ton to Aspinwall, $300 a ton (15 cents per pound,) across the Isthmus, and $80 a ton from Panama to San Francisco—say $394 a ton of 2,000 pounds. The agents of the line think, that when the railroad across the Isthmus shall be completed, the freight across will not exceed one-fourth of the above, $75 a ton,

—say $169 for the whole distance. Via Cape Horn to San Francisco, or Benecia, subsistence stores have been shipped during the present year from Baltimore at 90 cents per cubic foot, $4.50 per flour barrel; and from New York at $3.70 per barrel for flour, and 60 cents per cubic foot for other packages.

To the "3d." The same rates will apply to camp and garrison equipage and clothing; as all such such freight, by sea-going vessels, is charged for by the cubic foot.

To the "4th," I have to report that ordnance and ordnance stores have been sent from New York, via Cape Horn, in June, 1854, at two cents per pound for ordnance, consisting of heavy guns, carriages, shot and shells; in August at $28 per ton for the same, and in October at two cents a pound for the heavy ordnance; and 60 cents per cubic foot for ammunition, and other boxes, &c. None have been sent via the Isthmus.

To the "5th," I report, that, during the present year, the contracts for the transportation of military stores of all kinds are as follows:

From Fort Leavenworth to El Paso, $14 per 100 lbs.
From Forth Leavenworth to Fort Fillmore, $13.75 per 100 lbs.
From Fort Leavenworth to Albuquerque, $10.83 per 100 lbs.
From Fort Leavenworth to Fort Union, $7.96 per 100 lbs.

No transportation has ever been paid for men, as they march, the only cost being for the transportation of their baggage, subsistence, &c., on the route. This may be estimated at about $15 per man to Albuquerque. The above are about the average rates for several years past, and it may be presumed will be those for the future.

As to what was the cost of transporting artillery and supplies from the city of New York to the northern frontier, in the war of 1812–'14, this office furnishes no information, and I think it would be extremely difficult, if not impossible, to ascertain what were the average rates. There were no permanent or Macadamized roads in Northern New York during that period, and the passage of heavy-loaded wagons, at the best of times, extremely difficult and slow. It may be fair to presume that each ton cost at the rate of $5 (the daily cost of a wagon and team) for each ten miles of distance from Albany to the different points on the frontier when the roads were in the best condition, and double this in the spring and fall of the year—say from fifty cents to one dollar a mile for each ton transported.

For General Harrison's army on the north-western frontier, there were instances when the teams, loaded with forage, not only consumed all they were transporting to that army, but had to draw forage from the army depots to enable them to return. Much of the subsistence intended for the army was also consumed by the teamsters and escorts en route.

Since writing the above, I have information from New York that heavy freight can now be sent to San Francisco at about $15 a ton, and 30 cents per foot for measurement goods, and that a vessel could be chartered for Fort Vancouver at $20 a ton. These rates should not, however, be taken as ruling for the coming year, freights of all kinds being extremely low at this time.

I have the honor to be your obedient servant,

TH. S. JESUP, Quartermaster General.

Hon. JEFFN. DAVIS, Secretary of War.

ARTICLE III.

Palmyra and Hannibal, Mo.

An Extract from a forthcoming work to be entitled "Twenty-four Years' View of Palmyra and Marion County, in Missouri."

BY J. P. RUTTER.

The general pressure that prevailed for several years during and succeeding the disasters that marked the unfortunate epoch of the college and its attachees, as we have before shown, was sensibly felt by the whole community, as all had partaken of the excitement consequent on the hopes inspired by its advent, so all shared in the loss which caused and attended its exit. The whole country had participated in the wild schemes of adventurous speculation to which it gave rise. The pressure, therefore, found almost every man involved in debt, beyond his means of immediate liquidation. The necessities of the times would admit of no parley or delay; hence the court was the arbiter before whom that liquidation had to be made. Forced sales of property, at a mere nominal price, had the double effect of bringing ruin to its former owner, and of inducing a general fall in the price of property of like description. In fact a rapid decline in the price of property of every kind speedily succeeded, and families supposed to be wealthy, became bankrupt, and adversity drove its black chariot over the land: despondency, pecuniary distress, and general desolation marching in its train. On no place or part of the community did these calamities fall more heavily than on the hitherto flourishing town of Palmyra. All improvements ceased in the town,—mechanics thrown out of employment, sought it elsewhere, and left the place; town property

became almost worthless, houses became vacant, nor could they be sold for a fifth of their former value.

Necessity, it is said, is the mother of invention. Those persons who desired a town life, either for business or by inclination, turned their attention to Hannibal, a town situated on the Mississippi river, in the south-east part of Marion county, twelve miles distant from Palmyra. Here, it was thought that, although its improvement might be retarded during the continuance of the present adverse state of things, that had crippled everything, yet, from the advantages of its river location, its future prospective improvement would justify the outlay of funds in the purchase of property. Hence that town, which had never improved much previously, began to advance in population and in buildings, and has continued steadily to grow from that time to the present, with one temporary cessation. An unfortunate rivalry between the two places had sprung up, at a very early period, dating from the time of the first location of Palmyra, which for some years far outstripped its rival in the race for consideration and distinction. Situated more immediately in the centre of a fine body of rich land, then just beginning to settle, the attention of emigrants was naturally drawn thither, and as the rapid influx of emigration afforded to the farmer an excellent market at home for all the surplus they could raise on their newly opened and of course limited farms. The advantage of a river location was at that time not fully appreciated, and Hannibal was overlooked and forgotten. But as the country became filled up, and the flood of immigration ceased to flow with such rapid current, and as the farms became enlarged, their owners naturally began to look for a mart for the profitable disposal of their surplus products.

These considerations, together with those to which we have adverted above, gave an impetus to Hannibal, and she shot ahead of Palmyra with great speed, in her turn indemnifying herself by way of retaliation, and cancelling the old score. Each place, however, still cherishing the old rancoruos enmity, which to the disgrace of both places was suffered to foster and annoy each itself as well as its rival.

Palmyra, it may be said, for about the period of ten years did not improve at all. The few buildings erected not more than balancing the general delapidation of others; the business of the country gradually and partially left it, and sought new channels of trade at Hannibal, La Grange, in Lewis County, and at Quincy,

Illinois—while Hannibal, during the same period of ten years, continued to advance with giant strides in all the elements of prosperity, trade, population and improvement, and from a small village of a few houses, has grown so as to become an incorporated city, with about four thousand inhabitants. About four years since, the scale again turned in favor of Palmyra. Some lawyers raked up from the rubbish of old musty books and papers a claim to a part of the Hannibal property, and instituted suit for its recovery, and although the claim was believed not to be founded in equity, yet, favored by the forms of law, it had the effect of completely paralizing the efforts of the place in the way of improvement, during the several years of the pendency of the suit—emigrants and others being afraid to risk either purchases or the erection of buildings.

During this time of stagnation and suspension, Palmyra, in her turn, again took advantage of the defenceless attitude of her antagonist, and made another bold start to overtake her, and for the last three or four years has rapidly improved, having had erected within her limits many splendid buildings, together with a magnificent new Courthouse, which is now nearly completed, erected on the site of the old one, at the cost of about eighteen thousand dollars. Hannibal, in the meantime, has succeeded in shaking off the incubus which for years has weighed down her energies, and held the young giant in bondage. Her citizens, although they believed the claim to the property sued for was unjust, yet, wisely deemed it the best policy to buy up the claims, which they accordingly did at the price of many thousand dollars, taking deeds, and relieving the city from that obstacle to its improvement. The title to the property there is now compiete and undisputed, and she stands, so far as that is concerned, "redeemed, regenerated and disinthralled," and is rejoicing as a strong man to run a race for eminence and renown amongst her sister cities of the west, rapid strides, in which race she is again making in improvements of various kinds, particularly in those precautionary, preliminary and preparatory measures of arrangement, which must ever be the precursors of future prosperity. With a keen foresight and indominable energy her citizens have wisely entered upon that system of preparation necessary to prepare the way, and make her path straight for the race of emulation and laudable rivalry, which lies before her, in the erection of plankroads and other improvements, looking to, as they will inevitably produce the future development of her resources

and importance. Already they have two plankroads leading into the city: one from New London, the county seat of the adjoining county of Ralls, the other from Paris, the county seat of the large, fertile, populous and flourishing county of Monroe, Paris being distant from Hannibal about fifty miles, thus they have timely, well adapted the means to secure the end had in view.

The situation of the two rival places is quite dissimilar, and yet, each has its advantages adapted to its peculiar location. The situation of Palmyra is generally admired as very beautiful, being mostly level, and gently undulating with a beautiful rivulet running through it, dividing it into two nearly equal parts, and being well watered by seven never failing springs of pure cold water within its limits. The natural beauty of its situation is set off to the best advantage, and greatly increased and heightened by the large number of shade and ornamental trees, mostly black locusts, that are set out around and before most of the buildings throughout the entire town, giving it the aspect of a city in the woods.

The situation of Hannibal is broken or rolling, and agreeably diversified by hills and dales, by lofty eminences, graceful slopes, and pleasant valleys. The eminencies, of which there are many, consist of hills of considerable height, yet, of convenient ascent, with regular and handsome, though some of them steep, sides, and fine situations for building on top, from whence they command beautiful and extensive views and prospects of the surrounding country and of the river, both above and below, for a great distance. Their romantic and picturesque situation and scenery must make them for building of private residences very desirable and valuable. There is a creek, called Bear creek, running through the city, and emptying into the Mississippi, dividing Hannibal proper from what is called "South Hannibal."

The business statistics of the city show that a large business is annually transacted in the reception and shipment of tobacco, hemp and all other staple commodities of commerce raised in the country. There is also a very large business done in the slaughtering of beef and pork; several large establishments for the purpose being crowded during the whole of the packing season. Indeed, from the commercial situation of the place, and the extensive, fertile back country, this must necessarily be the case. Perhaps no place in America enjoys a more extensive, extremely fertile country in its rear, without any other navigable stream to divert its trade in

other directions, than does the city of Hannibal. The whole country back from the Mississippi to the Missouri river, a distance of two hundred miles, may be said to be a rich country; what poor land may be found not being in greater proportion than may be found in any other country whatever. If we were to make Hannibal or Palmyra the center, and describe a circle two hundred miles in extent, every way from the center, or four hundred miles in diameter, the circumference would perhaps include as much good land as can be found within the same boundary on the face of the globe. It would extend to the Missouri river, and take in a part of the best portions of Illinois and Iowa. Again, were we to extend the circumference, and describe a circle four hundred miles from the center, every way, we have no doubt it would include a *greater* proportion of good land, than can be found in the same extent of country in the world. It would, in addition, to much the best part of Missouri, take in also the best portions of Kansas and Nebraska, as well as of Iowa and Illinois. All this extent of country is now being settled, and when densely populated, there is no calculation to be made of the immense amount of commercial intercourse that must flow through its different channels of trade, and it is not too much to anticipate that, unless some unforeseen causes interpose as barriers, both Palmyra and Hannibal will participate in their just proportion in the benefits of the whole.

The business of Palmyra has always been good, for an interior town, though for a few years temporarily and comparatively lessened; particularly has it been always found for the amount of goods sold by its merchants, which is further demonstrated by the fact of their general solvency—few ever having failed in business here. There is likewise a considerable amount of packing done, particularly of pork, together with a due proportion in all the departments of mechanical labor and other industrial pursuits, as well as in the artistical lines of business, besides several blacksmith shops, several cabinet shops, tailors, bakers, &c., with many merchants and grocers; we have three jewelry stores, and in the list of fine arts, several excellent painters stand conspicuous to vindicate their character. There are two good taverns: the Virginia Hotel, kept by the gentlemanly landlords, McLeod & Kimsley, opposite the Courthouse, may be emphatically denominated the "Epicure's Elysium" of the place for genius and taste.

The unfortunate rivalry between the two places, however, is not

yet entirely extinct, but is gradually, we think, wearing itself out in its unnatural and unwarrantable course; for there is in truth no reason why it should exist at all: the interests of both are inseparably connected by their natural and relative positions, and ought not be severed by the jealousies or fancied interests of ambitious individuals—they ought rather to be assistants to each other, blessing and being blessed.

Article VI.

A Sketch of the Life of an Aged Pioneer, JOHN REYNOLDS, "The Old Ranger," Ex-Governor of Illinois.

The Pioneers of the region east of the Mississippi are rapidly passing from the stage of action, and in a few years their hoary heads and venerable forms will be seen no more in the land. Fearless, enterprising and patriotic, they abandoned the homes of their childhood for a life in the wilderness where, in opening the way for the advancing columns of civilization, they encountered difficulties and suffered privations, which entitle them to the everlasting gratitude of the American people. Self-relying, and always prepared to meet and overcome the dangers which surrounded them, they were indeed a band of heroes whose names and deeds deserve to be enrolled in the history of the country which they conquered from a savage race, and opened to the settlement of a civilized people. But the greater part of them have passed away, and the names of only a few have been preserved by the historian.

Biographical sketches of individuals who acted a conspicuous part in the early settlement of the country, would greatly enrich American history; and we have long desired to make the Western Journal & Civilian a general repository of this department of western literature. Much of this class of matter has already found a place in the preceding volumes of our journal, and we are pleased that we have the privilege of further enriching our pages by adding the following sketch with a portrait of one who has resided in the west almost three score and ten years: a pioneer in the broadest meaning of the term, who has acted a distinguished part in

private and public life; occupying a place in the first rank, and generally taking the lead in every thing calculated to advance the best interests of his own State in all its gradations, from a savage wilderness to its present elevated and important position in the confederacy.

JOHN REYNOLDS, Ex-Governor of Illinois, was born of Irish parents, in Montgomery County, State of Pennsylvania, on the 26th of February, 1788. When he was six months old, his parents emigrated to East Tennessee, and settled in that section of the State afterwards embraced in Knox County. The father of Governor Reynolds was a farmer, and worked himself for a living. As soon as his son was able, he assisted his father to work on the farm. At a tender age, in 1794, he was sent to a country school, taught by an ill-natured Irishman; but, owing to the cross and morose temper of the teacher, he learned little, or nothing; subsequently, at other schools, he learned fast, and could read and write tolerably well at the age of twelve years, when he left Tennessee. He grew rapidly, and as he generally worked in the summers on the farm, he soon became a good farmer, and delighted to work with horses.

In the year 1800, his father and family removed from Knox County, East Tennessee, to Illinois, and settled in Randolph County, near Kaskaskia. In their travel to the west, the family experienced much hardship, in crossing the high waters, in the wilderness between the Ohio river and Kaskaskia.

The old Ranger, when a lad of twelve years, drove one of the two teams of his father from Tennessee to Illinois. The father of Gov. Reynolds settled east of the Kaskaskia river, and there was no school established in that neighborhood for many years after he made his location. For many years after his father settled at this places, he had no neighbor in an eastern direction nearer than Vincennes, Indiana; and the nearest white settlement, east of the Mississippi river, in a southern direction, was at Natchez. Governor Reynolds, when a lad, residing on the farm with his father, was compelled to travel in the evenings of winter a mile or two, after the cattle was fed, to the residence of one of his neighbors, to take lessons in Arithmetic, and in this way he acquired a respectable degree of knowledge in that science. He was growing up, and there being no schools in the neighborhood, he was compelled to resort to these ex-

pedients, to obtain some education: when schools were established in the settlement, he sold his horse to a man who undertook to work in his place on the farm, while he went to school. In this manner, laboring the greater part of the year, and attending school in the winter, the Ex-Governor of Illinois, impelled by his native energy and ambition, became a good farmer, and also a tolerably good scholar, when he was quite a youth.

When at about the age of fifteen years, he observed and deplored the many great evils which flow from the imprudent use of intoxicating liquors: his father had been injured by it, and he firmly resolved, without the advice or suggestion of any one, that he would totally abstain from the use of ardent spirits; a resolution to which he has strictly adhered for half a century. This shows great sagacity in one so young, and furnishes an example which should be imitated by every youth who aspires to be useful to himself and to society.

Temperance was a great element in the life of Gov. Reynolds; it preserved his health; it kept his mind clear, and guarded him against being mislead by his passions, while under the influence of of exciting causes, and more than all, it has cherished and preserved that excellent moral tone of character by which he has been distinguished through a long life. Growing up to manhood, his traits of character commenced to develop themselves, and were marked and well defined. Energy, a laudable ambition and firmness seemed to be his prominent traits. His firmness is so strongly developed, that it is frequently regarded as obstinacy, and appears to be the leading trait of his character. Like many individuals, possessing solid talents, he is by nature exceedingly diffident, a peculiarity in his temperament which, as he remarked to us, has been a cause of much pain and of great labor in efforts to subdue it. But even at his present advanced age, and after being so long in public life, he is often so diffident, that it is painful for him to appear before the people. With these traits of character, together with a corresponding sound and strong intellect, he was destined to succeed in almost any business enterprise or occupation he might undertake. The young pioneer obtained a thorough knowledge of mathematics, which was a great source of pleasure to him. He was well acquainted with the theory and practice of land surveying, and also with the theory of navigation. He grew large and awkward, and weighed, when full grown, about one hundred and eighty pounds. His person is tall,

about six feet one inch in hight, and his gait rather awkward and inelegant. His head is large, and well developed, according to the rules of phrenology. Young Reynolds became exceedingly active and athletic. He ran foot-races with great success, and scarcely a man could pass him in a foot race of one hundred yards. The last foot-race he ran was in Knoxville, in 1812, for a wager of one hundred dollars, which he won.

In those early days in Illinois, all sorts of sports were in fashion and practised, such as horse-racing, card playing, shooting matches, and the like, and in all these sports young Reynolds took a prominent and successful part. The turf was his main delight, and often all the wealth he possessed, and that was generally only a horse, or so, he has had staked on a horse-race. He won a fine horse on a race in Cahokia, in 1811, and sold it to the keeper of a hotel in Knoxville for his board, while he studied law in that town.

About the time the young pioneer arrived at man's estate, his uncle, John Reynolds, of Tennessee, wrote a letter, perhaps half a leaf of paper, to his father, suggesting the propriety of sending his son to college in Tennessee, as there was not a college nearer to Illinois at that day than five hundred miles. This short letter decided the fate of the young pioneer, and after that time he farmed no more.

In the spring of 1809, he wended his way, with much diffidence and with a great weight of the backwoods manners on him, from Illinois to the college in Tennessee. His old *incubus*, diffidence, sorely afflicted him at college, and while he studied law in Knoxville: but an iron will, and a full share of obstinacy, forced him through these trials. He studied at the college with great assiduity and success. It was soon ascertained at the institution, that he possessed a considerable strength of intellect, and a capacity to learn with ease and speed any of the most intricate sciences. He applied himself so intensely to his studies, that he greatly injured his health. He went through the college in a remarkably short time, and understood well the studies he embarked in. He was a good Latin scholar, and also understood well the various sciences taught in this institution.

In October, 1810, he commenced the study of the law in Knoxville, Tennessee; but applied himself so intensely to his books, that he contracted a disease of the lungs, and a consumption, as it was

feared, had already seized on him: he had a cough, spit blood, had pain in his lungs, and experienced much perspiration during the night-time.

He abandoned his studies, and travelled home to Illinois. He spent the summer of 1811 in gay society, horse-racing, shooting matches, and other amusements, and took much exercise in the open air on horseback, and little or no medicine. By this course of conduct, and a strong constitution, he was again restored to tolerable health.

He again returned to the study of the law in Knoxville, and finished his studies in the fall of 1812. He read attentively the science of the law, but never did care for cases when they were not founded on fundamental principles. He always disliked a case lawyer, and considered it but a superficial learning to recollect cases without the principle.

He returned home to Illinois, in 1812, and found the whole frontier of Illinois, where his father resided, in a state of excitement, in regard to the war which had been declared that summer against England. The Indians, at that day, were numerous and exceedingly hostile to the Americans. Edward's campaign was about to march against the Indians on Lake Peoria, when the young pioneer reached home, and he joined a spy company as a private. He marched with his company in the campaign from Camp Russell to Peoria Lake, and back to the settlements.

The next year he enlisted in a company of United States Rangers, as a private, and marched in the campaign under General Howard, in the fall of the year 1813. By serving as a United States Ranger, he acquired afterwards, in his electioneering campaigns, the name of "the Old Ranger," which has become so common, that he is known by the name of the old Ranger almost as well as by his proper name. During the time he was in the military service, and when he was not out on duty, he procured a teacher and learned well the French language. He also practised speaking this language, until at one time it was as familiar to him as his native tongue.

Towards the close of the war, young Reynolds established an obscure law office in Cahokia, and possessed not many more law books, than could be tied up in a pocket handkerchief. At this time, he enjoyed the blessings of good health, energy, ambition, and poverty. He practised law here for three or four years, sur-

veyed lands, and speculated in lands. He used much industry, and soon acquired some wealth. This was the first start he made on "his own hook," and he studied economy, and exerted himself with some considerable success. The first effort he made to address the Court in Belleville, in 1815, was an awful failure. In speaking of this debut, he says: His diffidence was so great, that he scarcely knew his own voice in the court-room. He trembled from head to foot, and all ideas abandoned him, save that of diffidence. Many supposed he never could succeed: but there existed in his breast a fixed determination, "to do or die." An ignominious death or success was impressed on his heart. Time and labor worked much of that diffidence off. His acute sensibility was born with him, and he consoles himself with the reflection that, although on public occasions it has been a source of much pain, yet, under the ordinary circumstance of private life, it is an infinite source of delightful enjoyment.

The various passions seem to be singularly marked in the mind of Ex-Governor Reynolds. The milk of human kindness was born with him, and mingles with all his actions; yet, he is rather irritable for a moment, and impulsive. He is sincere and steadfast in his friendships, and possesses an acute feeling of dislike for ingratitude and contumely offered to him; he is frank, open and generous in his manners and habits, but dislikes extravagance and useless expenditure of money.

A singular defect exists in his mind: he never did, nor can, understand music, and never did sing, nor attempt to dance; he is nevertheless charmed with songs, music and poetry. About this period, he commenced collecting a library, and has at this time, a large library of well selected and choice books.

As a lawyer the old Ranger succeeded well, and became rather famous in judicial proceedings, where a scramble before a jury on contradictory testimony was the theater; there, his native energy and strength of intellect were generally triumphant. His speeches to the juries, although neither elegant nor eloquent, were generally impressive and efficient; they were interspersed with a natural wit and humor of a peculiar character, without effort, and mostly abounded with reason and common sense. His addresses were delivered with so much fervor and naiveté, eminating warm from the heart, that they always invited the attention of the audience, and often convinced them; they generally contained original concep-

tions of his subject clothed in a peculiar language, and delivered in a style which made them interesting and convincing.

Governor Reynolds never remained long enough at the bar to become eminent in his profession: other pursuits called him from the practice on many occasions, to the detriment of his professional career.

In 1817, young and ardent, he married a beautiful French Creole in Cahokia; she herself possessing about the same temperament, they lived together happy in the French *menage*. In their domestic circle they used the French language for about seventeen years, during the life of the lady.

Up to this time, Governor Reynolds seems to have had no taste for politics. He regarded stump speeches as a coarse, forward and vulgar performance, and disliked the intrigue and management often interwoven in political scrambles; but at the formation of the State Government, at Kaskaskia, in 1818, without his solicitation, he was elected Judge of the Supreme Court by the General Assembly of the State. This position changed his course of life, and almost forced him to enter the political arena. The Constitution required the Judges and the Governor to compose a Council of Revision, and they were compelled to attend the sessions of the Legislature. It was almost impossible for a young, ardent, aspiring man to keep aloof from political discussions.

Governor Reynolds remained on the bench for six years, and performed much duty. The law required the four Judges of that day to hold all the Circuit Courts, and also the Supreme Court. All this service was performed for one thousand dollars per annum, often paid in bank notes below par.

Although the laws were well executed by Judge Reynolds, yet, some were dissatisfied; because he was too lenient, and did not fine the delinquents heavy enough. It is true, he was not as well qualified for a judge as he was for a legislator. He did not possess that formality and empty ceremony that many Judges assume and many people admire. Under his administration two persons were hung for murder, and the laws generally were well administered.

In the reorganization of the Judiciary, in 1825, Judge Reynolds was not retained on the bench, and he then resumed the practice of the law with vigor and efficiency. He attended to a large circuit, composed of the counties of Monroe, St. Clair, Madison, Green, Pike, Morgan, and Sangamon. His practice of law was

good, and he also practised politics and electioneering with the people. He was familiar, accommodating, and agreeable with the masses, and enjoyed their devoted attachment. The juries in his circuit gave him their confidence, and he scarcely ever lost a case, where he had an even chance with his opponent. His speeches in Court reached the masses, who always hung on the courts to hear him speak; he had the ingenuity exactly to mix politics and law together in his adrresses, to convince the juries and the bystanders: one the tribunal of the law, and the other of politics. No man in the State ever possessed as much personal popularity with the masses as Governor Reynolds did.

In 1826, a party was formed in St. Clair county, and all their candidates selected for the county offices. On this ticket the old Ranger and friends were not admitted. He organized his party in opposition, and he, and almost all his friends, were elected. This was the first effort he made in an election. He entered the Legislature with an ardent and enthusiastic ambition to advance the best interests of the county and State; he took a bold, decided stand in the halls of legislation, without reference to party or persons, and performed much good to the public. It may in justice to him be said, that he is the founder of the Penitentiary, and that he obtained its location at Alton. He urged on the public mind and the Legislature many other important measures, and although some did not become laws at the time, yet, the public was prepared for them in after days.

In 1828, he was re-elected to the General Assembly from St-Clair county, and still pursued a liberal and high-minded policy, that attracted the attention of the public. In both these Legislatures, Governor Reynolds was mostly the leader of all important measures, and obtained much popularity and standing. It was easily discovered, that his mind was better adapted to the halls of the legislature than to the bench. In one case a beaten track was followed, while in the other a larger field was opened, which required a more comprehensive and liberal mind.

Parties were formed in the State for some time, and the excitement was strong between the Democrats and Whigs; each party was arrayed, and much bitter feelings existed between them. The old party in the State that supported Mr. Crawford for the Presidency, had joined the Jackson Democrats, and were Ultra and proscribing. The original Jackson party was not so rabid as the

other, yet, equally firm and efficient. Governor William Kinney was at the head of the Crawford Jackson party, and the old Ranger was placed in the front of the original Jackson men, and on this platform was commenced the canvass for the office of Governor of the State, early in the year 1829. Reynolds and party knew well the great power of their opponents, and commenced the campaign a long time before the election, which was in August, 1830. Gov. Kinney had all the influence and patronage of the General Government to aid him: but the old Ranger had voted for Jackson in 1824, and had been, and is to this day, a regular old line Democrat, which counteracted the influence of the General Government. The whole State was agitated to the centre by this gubernatorial election. The most bitter and vindictive feelings prevailed, and every one, male and female, took sides with a zeal and phrenzy that was surprising. Speeches were made in every county in the State by the candidates and others, and printed matter flooded the country. It was in this election, that the old Ranger made his first political speech. He was elected by a considerable majority, and administered well the State Government for four years. His messages and general course were harmonizing and conciliatory, and towards the close of his administration, the democratic party was better united and more efficient than it has ever been since.

Gov. Reynolds found the State currency rotten, with the old State bank, established in 1821, and the notes payable in 1831; he strongly urged upon the Legislature to pay this debt of about one hundred thousand dollars, and thereby save the credit of the State, and restore a sound currency. His policy was adopted, and much good resulted to the State by it.

The Black Hawk war occurred during his administration, which greatly increased the responsibility of his station, and caused him great perplexity. Letters poured in on him in the spring of 1831, which showed the frontiers to be in imminent danger; and after much deliberation, he called out a large body of the militia, and saved the country. General Gaines and the Governor made a treaty of peace and friendship with Black Hawk and a band of Indians; but the next year the same Indians recrossed to the east side, with hostile appearances, that alarmed the whole northern frontier. The Governor was again compelled to call out a still larger force than he did in the previous year. After long campaigns, which lasted all summer, the enemy was at length reached and chastised at the

Heights of the Wisconsin, and at the battle of the Bad Axe. Gov. Reynolds was authorized with Gen. Scott to make treaties with the Sacs and Fox nations of Indians and the Winnebagos. Just and equitable treaties were made, and large cessions of country were made by the Indians to the General Government. The territories on which the State of Iowa is formed, and a large tract of country in the State of Illinois were purchased of the tribes owning the same. Gov. Reynolds was recognised by the United States as Major General in the Black Aawk war, and was paid accordingly.

In August, 1834, Gov. Reynolds was elected a member of Congress, and entered the Halls of Representatives in December of that year. Although this was a strange theatre to him, yet, he was prudent, discreet and laborious in the performance of his multifarious duties, and made a good business member. At his first entrance into Congress, he made very few speeches, but labored attentively in the committees, and flooded his Congressional District with public documents.

In the summer and fall of 1834, he was elected at the general election, and also elected at a special election, to fill the vacancy occasioned by the death of the Hon. Charles Slade.

In the summer of 1836, after being a widower for eighteen months or so, he married in the District of Columbia, an amiable and accomplished lady, which detained him from his district, and he was beaten for Congress by a few votes.

In 1837, being out of public life, he could not remain inactive, and he and company constructed the first railroad north of the Ohio and west of the Alleghany mountains. This road was six miles long, built from the coal mines at the bluff of the Mississippi across the American bottom, to Illinoistown, opposite St. Louis, Mo. The construction of this road was a Herculean task at that early day, and one which the company performed without much knowledge or money: The principal available capital of the company was energy.

In the spring of 1838, the old Ranger offered again for Congress, and was elected. This election was one year before he took his seat as a member, and without his solicitation or knowledge, Gov. Carlin appointed him commissioner to proceed to Europe and obtain a loan of four millions of dollars, to construct the canal. Afterwards Judge Young, then a member of the U. S. Senate, was added to the commission. Gov. Reynolds, by the assistance of Gen. Rallings, one of the Fund commissioners of Illinois, obtained

a loan of one million of dollars of the U. S. Bank of Pennsylvania, at Philadelphia, to carry on the canal during the summer of 1839, and in May of that year he set sail for Europe. The sight of Europe was strange and singular to the old Ranger; but his common sense and extensive knowledge of mankind enabled him to succeed to the entire satisfaction of Gov. Carlin and the public. Judge Young and Gov. Reynolds procured a loan for the canal, and some of the money was expended on the construction of the canal; but the money pressure set in hard, and both the State and the bankers in London, with whom the loan was made, failed to perform the contract. The State also failed to pay the interest.

Gov. Reynolds visited many parts of England, and crossed over the channel, from Dover to France. He remained in Paris some time, and visited the country around that great city. He traveled to Belgium, and examined the curiosities in Brussels and Antwerp. He then returned to London, and remained there most of the summer of 1839. He visited Windsor Palace, and saw the scene of the merry wives of Windsor. He returned by the cities of Bath and Bristol, and at the last named city, he embarked for the United States. On his return voyage, the old Ranger experienced a terrific storm on the ocean; but the steamer Great Western rode out the storm, and landed the Governor and the other passengers safely at New York.

In December of this year, Gov. Reynolds entered Congress again, and with his former experience, he made an efficient and business member of Congress; he was frequently placed on important committees, and at that session he was chairman of the committee on public lands, which was one of the most important committees in the House. He made strong common sense speeches on many important subjects, which obtained some considerable celebrity at the time. He advocated the erection of hospitals on the western waters, which measure was adopted. Scarcely a member was more active or efficient, than the old Ranger was in Congress, in the sphere in which he acted. His speeches in Congress would make a volume of sound common sense matter, which might be read with profit.

In 1840, he was again elected to Congress, and in all served his constituents for seven years in the House of Representatives. He acted uniformly with the Democratic party, and the people never whispered a complaint against his votes in Congress or his actions.

He served the people in Congress to the best of his abilities, and so every one in the State unanimously agree at this day.

In his district, the young politicians possessed an ardent ambition for his place in Congress, and combined together to effect their object. His popularity was so strong with the masses, that his rivals and the young politicians in his absence organised the caucus system, and beat him for the nomination by a *packed convention* in 1842.

The old Ranger, becoming aged and somewhat sobered down, yet, possessing great energy and mental activity, now entered the field of science and literature, and studied the classics with youthful vigor. He had been for thirty years, or more, collecting a library, and had selected in both Europe and America many choice and valuable books. Of the Latin, French and English classics, his library contains nearly one thousand volumes, and in this delightful retreat with the authors of ancient and modern date, he spends much of his time, which is now entirely under his own control. He has acquired a handsome small fortune, and lives in peace and happiness with his agreeable and accomplished wife; although they are not blessed with any offspring. He possesses a fine house and beautiful residence in the city of Belleville, and is surrounded with all the comforts necessary to make life agreeable and happy. He possesses a peculiar disposition for the enjoyment of society, and is delighted with gay and brilliant company as well as with the grave and philosophic. His kindness of heart and benevolence are proverbial, and as he has resided so long in Illinois, he enjoys a happy meeting almost daily with those to whom he has done favors. This is doubtless a great source of happiness to him in his old age.

In 1846, the county of St. Clair needed a macadamised road from Belleville to the Mississippi, and some other improvements, and the old Ranger was elected to the General Assembly, to effect these objects. A charter for the above named road was obtained, and the improvement made. He was exceedingly active and efficient with others in making this road. He was in every respect an efficient and business member in the General Assembly; he had by his age and experience great influence with the Democratic party in the Legislature of that session.

It became necessary in the progress of the country to construct other and further improvements in St. Clair county, and in many

other sections of the State; and in 1852, the old Ranger was again elected to the General Assembly, to obtain charters for these improvements. When he appeared at Springfield, the seat of government, his friends of the General Assembly elected him speaker of the House of Representatives, although he was not well qualified for the office, nor ever solicited the place. There is a formal dignity, without meaning, and a technicality, always required in the speakership of a legislative assembly, that the old Ranger never acquired, and therefore was not so well qualified in this respect for the duties of the office; but his sound common sense, without any great regard to nice formality, enabled him to execute the duties of the office to the entire satisfaction of the public, as well as the approbation of the House. It was known from his previous life, and his deportment in the chair, that he aimed at impartiality, justice and the advancement of the best interest of the State. These traits of character, and his impartial decisions, made him extremely popular with the House of Representatives. Not a decision he made during the transaction of a great amount of business in two sessions of the General Assembly, was appealed from, but the speaker and the House transacted business together with the utmost cordiality and harmony. There was a called session in the winter of 1854, and in that, and the previous session, although only forty days long, an immense amount of important business was transacted. In both these sessions of the General Assembly, various important railroad charters were created, and other improvements of the State advanced.

The office of the speaker of the House is the last important position that the old Ranger has filled; but he has not been idle since, nor inactive. He has written and published four different works within not much more than three years, that are very creditable to him as an author, and which have also done the State lasting service. His first work, entitled "The Pioneer History of Illinois," is a plain, unvarnished history of the Pioneers of the State together with sketches of the rise and progress of the country. This book war written in a hurried manner, and is singularly defective in possessing neither chapters to any amount nor any index. This book, and in truth all his works, are written in that singular unpretending style of *naiveness*, that makes his writings so acceptable to all classes of people. In his style and composition, there is no labored and rounded paragraphs, to show the reader what an ele-

gant and eloquent writer he is; but he moves straight on with his thoughts, like a person narrating the truth from the heart. The works of the old Ranger are certain to secure all classes to read them, and are generally approved by the public. One of these works is a fiction, contained in a small pamphlet, called "The Life and Adventures of John Kelly." This did not succeed as well as he considered it should have done. One chapter in the pamphlet "John Kelly," on the creation or origin of animals, is worthy of particular consideration.

The next work he published, contained sketches of the country over which the author traveled in 1853, from Belleville to N. York, by the northern route, and back by the Ohio river. He displayed in this small volume much labor and some talents in describing the country and the Falls of Niagara. The Crystal Palace has also a place in the work. This is a work of considerable merit, and has been generally read and approved by the public.

His last work, just placed in the hands of the public, contains six hundred pages, and is a book of considerable merit. It is entitled "My Own Times," embracing also the Life of the Author. On this work, the Ex-Governor has labored with energy and activity, and his efforts have been crowned with success. This is acknowledged to be the best history of Illinois that has yet been published. The author having resided in Illinois since the year 1800, was therefore able to give a history of the country from his own personal observations. His memory is remarkably retentive, and it has, together with his sound judgement, given him the power to relate the history of the times, through half a century, with all the details and circumstances. This volume contains the histories of all the wars embraced in the last half century. The Anglo-Indian war of 1812 is narrated with precision and exactness, and the same with respect to the Black Hawk war. The scenes in the Congress of the United Stutes, for seven years, wherein he was a member, are described with graphic effect. Also his travels through Europe, in 1839, are presented in a prominent manner in this work. His tour in Europe is interesting, as the whole volume is, to the discriminating reader. Sketches of the singular and eventful life of the author are presented by one who knew him better than any other person. His life will do service to demonstrate the fact, that any person in America can procure an education, if they will only exert themselves to accomplish the object. He had a worse op-

portunity to attend school and college, than any one at this advanced day possibly can have. This book exhibits western character to the life, and will be read on that consideration by the masses throughout the Union. No one knew the western people better than the old Ranger; as he was one of them himself, and his description is a fac simile of the masses of the West, fifty years back. Although this work is just out of the press, yet, it is hailed as the best history on the subjects of which it treats, that has been published. There is little doubt but that twenty thousand copies of this work, and perhaps more, will be sold in the State of Illinois alone.

We conclude this article by stating, that the old Ranger enjoys excellent health and spirits, and seems as young and cheerful in his disposition, as he was at eighteen. He cannot remain idle and inactive: but what he will turn his mind to next, we know not; but one thing we believe, that it will be something to advance the best interest of Illinois, and the people generally, which has mostly occupied his time and labors throughout his life.

ARTICLE V.

On the Nature, Causes, and Effects of Atmospheric Electricity.*

If we allow ourselves to be instructed by the analogies of the friction electrical machine, the Leyden jar or the Voltaic battery, we shall find that the essential condition for maintaining a charge of electricity, is the existence of two bodies or portions of the same body (which are generally conductors,) separated from each other by a non-conducting medium. An electrical charge implies the presence of two bodies in opposite electrical states; and the well-known attraction mutually exerted by two such bodies would lead soon to a discharge, if they were not separated by the insulating medium. There is no reason why the solid earth should not play the part of one of these bodies, while the other is represented by the upper regions of the atmosphere or by the clouds floating therein. As the surface of the solid earth is separated from the region of clouds by the non-conducting air, an electrical charge may be maintained by the earth on the one hand, and by the clouds on the

* Condensed from the American Almanac of 1854 and 1855, from the pen of Professor Joseph Lovering, of Harvard University.

other, and this charge will be limited in intensity only by the dryness of the intervening air. Thus the whole earth resembles a Leyden jar, or more exactly, on account of the large distance between the clouds and the earth, an electrical machine, in which the rubber is removed from the prime conductor by a larger space than that which separates the two coatings of the jar, and in which, therefore, the electricity is more free than in the jar.

Observation shows that this electrical charge which the planet is capable of sustaining, it generally does sustain to a greater or less degree. As every change in the condition of matter, whether mechanical, physical, or chemical, places it in the electrical state—as heat, both directly and by leading to combustion and evaporation, provokes this electrical state—we are at no loss for exciting agents which shall give to the earth and clouds the whole or a part of the electricity which they are designed to hold.

With regard to the character of electricity, it may be said that the earth is generally charged negatively, and the atmosphere positively; the intensity of the positive charge increasing with the elevation of the stratum observed. Any discrepancies between observers in respect to this point may be referred to local action. Peltier has proved the negative character of the solid earth, as compared with its atmosphere, by means of the galvanometer. One end of the multiplier was joined to a pointed rod of metal and raised into the air, the other end being soldered to a metallic plate which was buried in the earth. As the electricity under examination possesses considerable tension, the strands of the multiplier must be insulated from each other with unusual care. Sturgeon found the electricity of the air most positive during the cold northeast winds of March. Weekes observed that the electricity was strong when there was a breeze from the eastward. Cuthberton states that he always found the electricity of the air positive. Crosse, on the other hand, thought the air was always negative. Davy, too, in his Agricultural Chemistry, seems to imply that the air is negative. In some of the observations, probably, the requisite precautions were not taken to guard against deception. Pine cautions the observer against making his experiments near a tree. The free electricity of the air, positive in character, and increasing with the elevation of the spot observed, is not found in the interior of buildings. The air of rooms, vitiated by respiration, is negative according to Murray. He also states that the air at Orbitello and in the Pontine marshes is negative. The most intense charge is observed in open places, such as quays, bridges, and squares. In such localities as Geneva, where low fogs prevail, it is particularly intense. A persistent series of systematic observations in electrical meteorology may perhaps bring these discordant and anomalous results of observation into harmony with each other. It is no small part of the difficulty, that the instruments which report of the electrical state of the air, may, like those which measure its

temperature, or its moisture, or its winds, respond more promptly to local than to general influences, and so give an uncertain sound, instead of registering that state, as the barometer registers the physical element to which it is adapted, in its most general character. A series of daily observations made by Schuebler at Stuttgard, from May, 1811, to June, 1812, in all kinds of weather, may throw some light upon the subject. He reached the following results: 1. The charge of electricity is more intense in storms of rain, or hail, or snow, than when the sky is fair. 2. At such times the charge is as often negative as positive. 3. The character in this respect often changes suddenly. 4. In cloudy weather, without any storm, the charge is positive. 5. The intensity of the charge is greater in winter than in summer. Schuebler also studied the electrical phases of the atmosphere at different periods of the day, and discovered some correspondence between the diurnal variation of the magnet and the daily curve of electrical intensity. The minimum of intensity occurred before sunrise, and again two or three hours after noon, and the maxima two or three hours after sunrise and after sunset. The range of the daily change increased from July to January, and decreased from January to July. In 1830, Arago repeated at Paris the same series of observations on the daily curve, and with similar results.

As a body becomes positively charged only at the expense of another which loses electricity, and is therefore negatively charged, the electricity of the air and of the clouds, whether, in fact, positive or negative, implies the existence of an opposite charge in the earth itself. The solid earth, with is atmosphere, has the same average fund of electricity always. There is no proof that it ever borrows electricity of foreign orbs, or makes to them a loan of its own. The phenomena under consideration are purely meteorological, and not cosmical. It is by a change in the distribution of this normal quantity of electricity that one part of the planet acquires an excess while another is deficient. But it is not so easy to prove, by direct experiment, that the earth is negatively charged, as to draw down and handle the positive electricity of the clouds. The unequal amount of evaporation in different parts of the earth's surface, and a partial distribution of moist winds, will produce charges of electricity in the air much larger at some places than at others, and the imperfect conducting power of the air will be unfavorable to a speedy equalization. On this account the electricity of the air will be in a large sense of a local character. The opposite and corresponding charge of the solid earth will more easily spread over its whole surface. With the ample range thus afforded to its own inherent diffusiveness, it will retain only a feeble power at any one place. It is not surprising, therefore, that the electrical charge of the solid earth is rarely recognised by the senses. Sometimes, and in some places, geographical locality may be opposed to an immediate diffusion of the electricity, so that, if the

exciting cause is active, a sufficient charge may accumulate to attract attention. In such cases, the electricity, following so far as it can spread the usual laws of distribution, will concentrate its forces around the sharp peaks of mountain-tops, which are the natural and appointed discharges to the planet. Hence positive clouds are seen to congregate as if by electrical attraction around this pinnacled battery of the earth. The electricity of the earth shows itself, if at all, by a brush or star of light on pointed objects resting on the earth and projecting into the air. The records of these displays have accumulated with years, and are found in the literature and common language of every age and country. The ancients distinguished them by the name of Castor and Pollux. In modern times, and around the shores of the Mediterranean, they are hailed as the light of St. Claire, St. Nicolas, St. Helena, and elsewhere they bear the appellation of St. Barbe or St. Elmo. The Portuguese call them "Corpo Santo," and the English "Comazants." These lambent flames, as they appear, have been seen blazing from the summits of the Himalaya and Cordillera mountains. They are frequently seen tipping with fire the masts and spars of ships. We are told that in the voyage of Columbus, as soon as St. Elmo appeared with his wax tapers, the sailors began to sing, thinking that the storm was over. The electricity of the earth, while in the act of discharging itself into the air, has been seen edging with light the manes of horses, the metal trimming of their harness, the lashes of whips, the brims of hats, the tops and edges of umbrellas, the sharp points of swords and lances, the extremities of hair and whiskers, the corners of chapeaux, the buttons upon the coat, filaments of straw, the beaks of birds, and the myriad needle-like terminations of vegetable growth, with that incomparable point and finish which they took from Nature's own hands. In 1778, these electrical brushes embellished the crosses upon the steeples in Rouen, as well as other points of eminence. At the siege of Kingsall, in 1601, the sentinel saw electrical tapers burning on the points of lances and swords. Guyan says that they are often noticed on the bayonets of the soldiers at Fort Gowraya, Bougie, 2,200 feet above the level of the sea. During a thunder-storm they have appeared like the work of induction, gleaming upon the points of the fire-arms in the armory of the Tower of London. In Poland, Captain Bourdet was astonished to see, in December, 1806, the electrical glow upon the ears of the horses, on the metallic knobs of their harness, and on the whiskers of the troops. On the 25th of January, 1822, the tops of the trees at Freyburg were touched with light during a snow-storm. In 1824, a load of straw became animated, and danced the electrical hop, each straw standing on end and shining at the top. In 1825, Sir William Hooker and a party of botanists, who were upon Ben Nevis, shed the electrical light from their hair when they lifted their hats. In May, 1831, the hair of the officers at Algiers stood erect,

decked out with fire. Walker, the English electrician, on the 8th of September, 1842, saw the same light on the top of his own lightning-rod. On the 17th of January, 1817, an extensive snow-storm was experienced in Maine, Vermont, Massachusetts, and even in Pennsylvania and Georgia. Professor Cleaveland says that upon this occasion three persons crossing the bridge over the Androscoggin observed the borders of their hats to be luminous, and the ends of their fingers, though covered with gloves, were radiant with light. Professor Dewey, of Williamstown, relates that, upon the same occasion, a physician saw the light upon the ears and hair of his horse. A gentleman tried to brush it from his hat, thus reminding one of the sailor who was sent to the top-mast to bring the fire of St Elmo down. In both cases, the experiment was attended with the same success. The light spread more widely for being disturbed. Other persons witnessed the same brightness on the trees, fences, and logs. It was reported that a hiss was heard when the hand was presented to these objects. Moreover, the lightning was frequent. A young man in Vermont described the phenomenon after this wise: It appeared as a star or spark oftener than as a brush. A sound could be heard at the distance of six or eight feet resembling that of water in a tea-kettle just before it boils. The effect was greater on high ground than on low, so that the light was then seen on the hat and shoulders. The brush was sometimes two inches in length and three-quarters of an inch in diameter. To spit was, to emit from the mouth a luminous stream of fire. At Shelburn, Massachusetts, a similar light was seen upon a well-pole; when the end came down, the light disappeared, and was kindled again when it went up. Arago mentions other cases where the spit was luminous, and one at least has come within my personal observation at Cambridge. In 1767, Tupper and Lanfiar observed, near Mount Etna, that, by moving their hands through the snowy air, they produced sounds which could be heard at the distance of forty feet. In 1781, Saussure, the great Alpine observer, felt a cobweb sensation among his fingers, and his attendants were able to draw sparks from a gold button on his chapeau. The beaks of birds have appeared luminous during storms; and it has been suggested that the eagle, "by some pre-eminence in this respect, acquired its cognomen of the minister of the thunderbolt." We may introduce here an experience of Sabine and James C. Ross, during an arctic voyage, as indicating possibly the electrical condition of the earth or air. They entered a luminous track about four hundred metres long, and while in it, they could see the tops of their masts, the sails and cordage of their ship, and when they left it, they passed suddenly into outer darkness.

Arago has collected, with amazing industry, passages from the classics which may possibly contain allusions to the electrical light. Thus Cæsar, in the African war, says that the lances of the fifth

legion seemed on fire during a night of hail-storms. Livy states that the javelin of Lucius Atreus cast forth flames for two hours without being consumed. Plutarch records the fact that when the fleet of Lysander was on the point of attacking the Athenians, Castor and Pollux arose, and stood on the two sides of the gallery of the Lacedemonian admiral. He refers to similar observations in Sardinia and Sicily. Pliny had seen just such lights on the points of the soldiers' pikes. Seneca alludes to a star which reposed on the iron part of the lance of Gylippus near Syracuse. And then there was the fire around the head of Ascanius.

In reference to the manner in which the earth becomes charged with electricity, it may be observed that there are three dynamical processes, very general and efficacious, which are going on at all times with greater or less violence in the air, all of which probably are concerned in the production of the electricity we observe in it, namely: 1. Evaporation; 2. The friction of the wind; and 3. Combustion. As early as 1749, Franklin had a theory that electricity was produced by evaporation, and in a way which had some resemblance to Black's theory of specific heat. When water evaporates, it requires a greater capacity for electricity as well as for heat. The electricity and heat, essential to the physical change of state, involved in the transition of matter from a liquid to a gaseous state, must be abstracted from surrounding bodies, which are thus cooled and left, electrically speaking, negative. As the vapor rises with its latent charge of heat and positive electricity, it finally reaches a region of cold, where it is again condensed, and the electricity and heat become free again, and make some demonstration. Thus, if Franklin had reasoned by strict analogy, he would have made the charge of the clouds positive, whereas at this time, he was under the impression that they were negatively electrified. In 1767, he had come to the opinion that the vapor is often positive. In the meanwhile—that is, in 1752—Nollet had made experiments upon evaporation. In 1782, Volta published his experiments upon electricity as a product of evaporation, especially that which he made by a mixture of water, sulphuric acid, and iron filings, in the presence of Laplace and Lavoisier. Saussure and Bennet also experimented on the evaporation of various liquids and from various vessels. They remark that the *kind* of electricity developed in the vapor was often anomalous. Saussure suggested that in some cases a chemical decomposition of the liquids might take place, or perhaps even of the vessel, which disguised the genuine result of evaporation. Pouillet, who has gone largely into the subject of the origin of atmospherical electricity, has come to the conclusion that the material of the vessel which holds the evaporating water has much influence, and that pure distilled water develops no electricity by evaporation; and that the saline or other impurities which water generally contains are in some way essential for the production of electricity by evaporation. If, says Bird, common salt be

put into the water which is passing into vapor, the vapor acquires positive electricity at the cost of the vessel, which is negative. If, on the other hand, an acid is mixed with the water, the vessel takes the positive charge, and the vapor goes up with a deficiency of electricity. Peltier has made many experiments upon the subject, and finds, as he thinks, something besides evaporation to be necessary to the production of electricity, and something the conditions of which can hardly be found in ordinary evaporation. It is proper, also, to add this fact, given by Pouillet, that Lemonnier discovered electricity in the air every day for six weeks between the middle of September and the end of October, 1754, although the season was very dry, and no clouds were seen. On the other hand, to prove that evaporation developed electricity, Rowell and Spencer made an experiment which showed that, where electricity was cut off by insulation, the evaporation was retarded. For this purpose, they put the same weight of water into two vessels, one of which was insulated, and the other connected with the ground by conductors of electricity, and they always found that the latter lost the most by evaporation. I will give the following method of Howard for showing the electricity of evaporation: "To the cap of a gold-leaf electroscope, I affixed a horizontal support for a candle, which projected two feet from the cap of the instrument, placed near the edge of a table; on the floor, immediately beneath, was an earthen vessel containing hot water an inch in depth. The candle being lighted, two or three hot coals were dropped into the water, so that there rose a sudden cloud of vapor. The electricity of this being collected by the candle, the leaves of the electroscope opened and struck against the sides."

Another cause of atmospherical electricity, and the one upon which Reiss particularly insists, is friction. Faraday shows, by experiment, that dry air rubbing against dry air, or against some other substance, would be inaction in respect to electricity. But moist air grinding against the hills, the trees, the rocks, would acquire a positive charge of electricity. The friction of two masses of moist air driven by opposite currents against one another might charge each, though with different kinds of electricity, and to a less degree than where the two rubbing bodies are more heterogeneous. Kaemtz, the distinguished meteorologist, relies on the efficacy of friction—of friction between strata of air differing in temperature as well as moisture, of which the coldest, and therefore generally the highest, takes the positive charge. In elucidation of this point, I may refer to the discovery by Armstrong, in 1840, of hydro-electricity, as it is called. When high-pressure steam issues from a boiler through a stop-cock, lined, for instance, with partridge-wood, electricity is abundantly produced; the steam and water being charged positively, and the boiler negatively. The elaborate experiments of Faraday have clearly shown that the cause of the electricity in this case is friction—not the friction of the steam,

but of the liquid particles mixed with the steam—against the inside of the pipe. Dry steam will not answer. Hence the apparatus makes provision for cooling and condensing, by a circuitous channel artificially chilled, a part of the steam before it escapes, so that it may contain the particles of water which do the rubbing. The steam itself is the mechanical power which works the electrical engine. The hydro-electric machine accordingly differs from the ordinary friction machine for producing electricity, incidentally in employing steam power instead of manual labor to work it, but essentially in selecting drops of water and wood for rubbing in place of glass and the usual amalgamated rubber. Leave now the workshop and the laboratory, and go out into the broad atmosphere; substitute for the working power of steam that of the wind, and you have a hydro-electric machine of Nature's own handiwork, and upon a magnificent scale. I will offer only two further remarks concerning friction, as one of the contracting parties for forging the glittering artillery of the clouds: 1. As friction of the air is inoperative without moisture, evaporation in the last analysis is to be thanked for the electricity which friction produces. 2. As the friction of moist air, as it is driven before the wind, must be one cause, if not the only or the principal cause, of atmospherical electricity, have we not some elucidation or the thunder and lightning which accompanies many moist storms, and makes so dazzling a part of the retinue which marches in the track of the tropical hurricane and the tornado everywhere?

Vegetation and combustion must not be omitted in making a catalogue of the sources of atmospherical electricity. Puillet inferred, from experiments, that the oxygen which plants give out by day is charged with negative electricity, and that a surface of one hundred square metres in full vegetation produces as much electricity in one day as the largest Leyden battery can contain. Kaemtz lays some stress on combustion as a generator of atmospherical electricity. The carbonic acid gas carries off with it positive electricity.

This experiment of Matteucci may have some applicability to the subject. He insulated a metallic plate of three square feet, covered with earth and salt; as soon as the sun acted upon it, the gold leaves of an electroscope connected with it diverged.

After it has been proved that an assigned cause is of the right kind in quality, the demands of a rigid science are not satisfied, unless it is also shown that it is of sufficient force in quantity. In the case under consideration, it may be difficult to do all this. It may be difficult to calculate from such data as exist how much electricity is concentrated on the average in the atmosphere at any one time for which an account is to be rendered; and it may be no more easy to estimate correctly the producing power of evaporation, friction, and their co-operatives. There are few of the mechanical operations of nature which can be brought within the limits of

strict mathematical investigation. The precision and delicacy of finish, united with great boldness of conception, which are claimed for astronomy, belong only to the mechanics of the solar system, and this, which is called the higher mechanics, is considered piecemeal. It has not yet entered into the mind of man to conceive of that highest and truly celestial mechanics which metes out the forces ordained to balance and move, not merely planets and comets, but stars, clusters, and nebulæ. Here it is the multiplicity of the stars which swarm in space, and the unnatural and parallactic crowding in certain districts, which make the confusion of thought. In meteorology, and indeed on many an arena of nature infinitely smaller than the earth's atmosphere, there is the same multitude of objects, and the same ambiguity in their position; and, besides all this, there is a variety of forces which cut in at various points besides the force of gravitation, and there also exist an irregularity of figure and a crowding of parts in the matter concerned, which contrast widely with the almost spherical units and the ample spaces of astronomy. To walk even in one of the narrowest paths of meteorology, who can compare numerically the quantity of electricity which diverges the tell-tale leaves of the gold-leaf electroscope and that which fills the Leyden jar, and then who can compare the quantity in the jar with that in the thunderbolt, and afterwards say how many such thunderbolts strike upon a certain assignable area of the earth's surface, and how much electricity besides this discharges silently and steadily upon the mountain-peaks, the million tree-tops, and the innumerable natural lightning-rods which point ever to heaven, and preserve the earth from frequent and violent electrical excitement, by bringing the electricity back harmlessly to the earth? And to account for the existence of so much electricity, after its value has been accurately ascertained, who can calculate, from the electricity which the evaporation of a drop of water contributes to the sky, how much ascends from the earth's waters? And who will undertake to calculate the friction of the winds and the electricity which they grind out?

Beccaria, who was one of the first to follow the lead of Franklin in pursuing the study of atmospherical electricity, estimated that as much electricity passed through the rods on the palace of Valentino every hour as was sufficient to kill three thousand men. Arago estimated that, when a cloud was present, a hundred sparks would pass a break in a lightning-rod in ten seconds, and this would be enough to kill a man; enough, therefore, to kill a hundred and sixty men an hour. In respect to evaporation, Leslie computes that 52,120,000,000 cubic feet of water, each weighing about sixty-two pounds, are lifted 18,000 feet into the air by evaporation each minute. Now, if the evaporation of a drop of water develops electricity sufficient to throw apart the gold leaves of the electroscope, who can say that the whole fund of evaporation, which is mechanically equivalent to 200,000 times the labor of the work-

ing population of the globe, may not be competent for all the requirements of electrical meteorology? In respect to the effects of atmospheric electricity, there are some meteorologists who, in their discussions and theories, have entirely overlooked its agency; while there are others who have exalted the electrical force into the first rank, and placed them in the van of the great movements in the atmosphere. Both of these views, in my opinion, are at variance with the truth. The electrical forces are not to be despised on the one hand, nor, on the other, to be enthroned above every other influence. The statistics of meteorology are various, and are collected for various purposes. But the most impor ant questions of meteorology, considered as a science, relate to motion. The statical aspect of this science is valuable as showing when equilibrium cannot exist, and where there must be motion, and how much motion there must be. The phenomena of meteorology are emphatically those of change and transition. The dynamical dide of the problem contemplates the laws of these changes and the origin and character of the forces which produce them. The degree of change and its direction are conveniently gauged and registered by the difference in the barometric height at the same moment for two places, or for the same place at two successive periods. But the cause of the oscillations in the barometer, and of the motions which are measured by them, is to be found in a disturbance of the mean temperature or humidity, or both, of the air, a disturbance originating, in each case, directly or remotely, in the action of the solar rays. While evaporation is going on under the provocation of the sun, and while the winds are blowing in virtue of moisture and of heat, both the winds and the evaporation produce electricity. This electricity acts by its own laws of attraction and repulsion, and produces motions, which combine, according to the established principles of mechanics, with the other motions which heat immediately causes; or one of the effects of heat—that is, gravitation disturbed by vapor. If we take a glass-plate electrical machine and suppose it to be turned by a wind-mill, instead of by manual strength, and if we apply the electricity which it generates to almost any mechanical purpose, we shall see that it would do much less execution than the wind itself which was spent in producing the electricity. Or, if we examine the dydro-electric machine—the boiler of a locomotive, for instance—we discover that it can generate large sums of electricity, surpassing, perhaps, all that we have ever seen produced artificially. Collect, now, the electricity which this maximum of art produces, husband it carefully, and dispose it so as to exert to the best advantage its mechanical power, and how much work can it do compared with the locomotive which generated it? If we were harnessed by any artifice, however skillful, to the heavy train of freight which the locomotive hardly fails to press upon its Herculean shoulders, would it not be utterly crushed by it? Hence we infer that, in meteorology, the work, while it is

done by electricity, is small in comparison with that which is done by the heat, acting through the wind and moisture, which sets free this electricity. And if it were otherwise—if heat could act with more economy through the medium of electricity than through that of elasticity or gravity, or through any other medium, would a thorough analysis of the phenomena of meteorology be satisfied with stopping at the electrical forces? Would it not, finally, come to the sun's heat as the prime mover and disturber? So it would appear that, although the phenomena of meteorology are limited to this planet, the cause is cosmical and not meteoric.

Without regarding electricity as the exclusive or even the principal force which manifests itself in meteorology, we may refer certain classes of phenomena to its more particular agency. Of this description is the aurora. The great evaporation of the aurora, in many cases, might require us to consider it as without the pale of meteorology, did we not expand the limits of the earth's atmosphere, and therefore the limits of the science which treats of it, beyond the region of twilight to a spot as distant as any which gives indications of the existence in it of any substance affiliated with the grossest matter of the earth. Now, the relation which has been observed to hold between the direction of the dipping-needle at any place and the vanishing-point of the auroral beams, indicates a dependence of the aurora on terrestrial magnetism; that is, upon an inseparable property of the earth. Again, it is supposed that the clouds do not shine entirely by the light of the sun, but that they are themselves, to a small degree, self-luminous. In proof of this, Mr. Spencer alleges the case of an astronomer who could not see to read his time by bright starlight, but was able to do it after the heavens were overcast with clouds. Now, it has been suggested that these instances of phosphorescence in clouds are the effects and the tokens of their electricity. The meteoric wonders of luminous rain and snow may indicate a high charge of electricity in the air breaking out into a glow. In other cases, as, for instance, in the moon, the planets, and the comets, where it is known that these bodies shine eminently by reflected light, that small amount of independent light which they may emit from a sort of phosphorescence, is liable to be overlooked and overdrenched in the superior brilliancy of other lights; but these independent rays, where they exist, may be nice traces of electricity.

There are motions among the clouds which are probably caused by the electrical attractions and repulsions. It is no uncommon sight to behold clouds moving contrary to the wind, and also sometimes in different directions, with respect to one another.* This

* A remarkable phenomenon of this sort was observed by me on my second ascent of the Peak of Teneriffe, in September, 1833. In passing through a dense stratum of clouds, several hundred feet in thickness, small currents of air traversed portions of the thick mist in which I was enveloped with unequal velocities and often from opposite points, waving the shrubs and ferns in a very singular manner. Sometimes these currents moved in circular and tortuous directions. The same thing was noticed thirty-four years before by Baron Humboldt, under similar circumstances, near the same spot. "The causes of this partial motion

is properly explained, in many cases, by saying that different currents prevail at different heights, and each cloud obeys, like a balloon, the current in which it happens to be at the time. But it is impossible that the clouds should be electrified, as they sometimes are to a high degree, without exerting their electrical attractions and repulsions, and thus producing motions which may modify, and perhaps materially, such other motions as the winds may start. On the 14th of June, 1842, it was observed that the focus of a thunder-storm in England followed the course of the Thames. There, the electrical forces seemed to impress their own character upon the direction of the motion. The clouds acted by induction upon the earth, and particularly upon those parts which conduct the electricity best, and prepared the way for the attraction which guided their own course.

Another way in which electricity may influence the atmospherical movements is this: When the particles of air are electrified, they tend to fly asunder, as the pith-balls hanging upon the prime conductor of the electrical machine. This tendency of the particles to separate, adds to the expansive force of the air, and is equivalent to so much additional heat. A large amount of electricity set free at one place, may give a strong explosive force to the air, and produce in this way very grand effects, though they will be local and ephemeral in their character. But in a general view of meteorology, this mode of action cannot be paramount to all others. For when it is considered that heat, acting by one or another agency, produces the electricity which is in the air, it can hardly be believed that a given amount of heat expended in producing electricity, and, as a consequence of electricity, new expansion, can be of more avail than the same amount of heat if exerted directly on the air to expand it.

Faraday once made a remark, based upon his own experiments, which is often quoted and sometimes misconceived, to this effect: that a grain of water gives out, by its chemical decomposition, as much electricity as might charge a thunder-cloud. Hence many exclaim, philosophers and those who are not—How immense the *quantity* of electricity in a drop of water! We might with as good reason cry out—How insignificant the quantity of electricity in a thunder-cloud! And, indeed, if electricity be in reality a fluid, as we at present are constrained to conceive it, the grand effects which are unquestionably produced by it, as those of the thunderbolt, are attributable to the incomparable freedom, elasticity, and, consequently, the immense velocity of the fluid, and not to the quantity, which may be no greater than that which binds the oxygen and hydrogen of a particle of water, and which, if gradually set free, is insignificant and almost inperceptible. There may be other

of the clouds," he observes, "are probably very various; we may suppose it to rise from some impulsion at a great distance; from the slight inequalities of the soil, which reflects in a greater or less degree the radiant heat; from a difference in temperature kept up by some chemical action; or perhaps from a strong electric charge of the vesicular vapors.—D. J. B.

local effects besides these, seen where lightning has struck, as, for instance, the ravages of the tornado, which are the work of electricity suddenly accumulated and bursting as suddenly out before it has had time quietly to discharge itself by the ordinary channels. In the convulsions of the air, and even of the solid earth, in earthquakes, volcanic eruptions, and hurricanes, electricity finds a congenial atmosphere, and contributes to swell the force of destruction. But even here, while it makes its own mark on the phenomena, it is itself the effect of many antecedents, and can be no larger or more terrific than the forces which have been expended in producing it. These other forces, it is true, by taking the guise of elect[illegible] may acquire a degree of centralization and a facility for in[illegible]ous action which do not belong to their own sluggish nature.

Thus, in various ways, such as have been already described, electricity is ascending from the earth to the air, or, in other words, the electrical equilibrium holding between the earth and its atmosphere is destroyed. Even while the accumulation is proceeding, some effects, as the electrical attraction and repulsion and the motions which follow, are produced by these forces, the release of which from the usual balance is the essence of electricity. But in the course of time, the clouds will be electrically overloaded, and the forces of which I wrote will be so strengthened by constant reinforcement as to compel a return to equilibrium. The influences which carry up the electricity into the air cannot hold it there. This must be left to the insulating power of the air itself, which is generally very imperfect. In dry states of the air, the electricity must wait till it is strong enough to break down in luminous beams through the dry air, revealing its motion possibly at these times by the tremulous flashes of the aurora. Sometimes, its passage from cloud to cloud is bridged across by the moisture, or its descent to the earth is made very easy by the columns, or rain-drops, or snow-flakes. But whether it creeps slyly from place to place, or dashes boldly along, as in the lightning, the most important disturbances are produced by the electricity of the atmosphere, as well as electricity in general when it is in motion, when it is hurrying back to the haunts from which it was enticed. Then it burns, blazes, storms and tears; then it convulses and sometimes kills. Manifest pains has been taken by the Author of nature to keep down all electrical excesses. The lightning which kills suggests most forcibly the Merciful Hand which generally spares. Even if we are not able to decide whether the development of electricity is incidental merely to other atmospheric movements, or whether it is a most important object of them, certain it is that electricity is crowding into the air, and in quantities that would threaten all the time, did not Infinite Wisdom provide in more ways than one an escape for the redundant energy, and, ages before Franklin planted on the earth the first lightning-rod to catch the destrucive fluid as it poured down, make the earth bristle all over with his divine protection.

[To be continued.]

ARTICLE VI.

Hannibal and St. Joseph Railroad.

Those who are not familiar with the arguments upon which the Act of the General Assembly "To secure the Completion of certain Railroads in this State," is based, may find them stated in the following report which we specially commend to the perusal of such individuals as do not approve of the principles and policy of that measure.

Viewing the following document in connection with the prominent part taken by Col. R. M. STEWART, in respect to this subject, in the late session of the Legislature, he is to be regarded as the leader in establishing a measure designed to ensure the early completion of our system of public improvements, and we trust with confidence that the result will abundantly vindicate his foresight and the soundness of his judgment.

PRESIDENT'S REPORT.

To the Stockholders of the Hannibal & St. Joseph R. R. Co.

GENTLEMEN:

I have the honor of submitting to you a report of the condition of the affairs of the Hannibal and St. Joseph Railroad Company, and the progress of the work under its charge for the present year.

The report of the treasurer exhibits a balance at his command of $389,842 03. This balance consists of cash, state, county and city bonds. Of the county and city bonds it may be well to remark that the company has not been able to sell or otherwise make them available, either in the construction of the road, or in the payment of land damages: and although they may be considered good, (and on part of them interest has been paid,) yet they constitute a species of security that has not obtained that available character in the market, or amongst our own domestic capitalists, to which they are intrinsically entitled. Those counties and cities which have been permitted to pay their calls in deferred bonds, ought, in justice to the individual stockholders, either to pay the interest upon their bonds, or provide a fund for their early redemption, and levy a tax to pay the subsequent calls.

Of the state bonds received by the company, it will be seen that there are now on hand 339, equal, at a par valuation, to $339,000. It should be remembered that under the provisions of the Act loaning these bonds to the company, they could not be sold for less than par, while their market value was continually diminishing. A subsequent Act of the legislature wisely empowered the company to dispose of them at their market value, and to procure them in amounts of more or less than $50,000, as the companies expended their own means.

Under the provisions of the last Act, and whilst the market value of the state bonds has ranged from ninety to ninety-five cents to the dollar, the company has exercised a proper economy, and

has only disposed of them at less than par, as the last resort. The Fiscal Agency of the company being reluctant to part with them at too great a discount, and relying upon their ultimate advancement to the high standing to which they are justly entitled, have endeavored to hold them until they could be disposed of at their real value. These bonds are deemed to be based upon as solid a foundation (the credit of the state never having suffered a protest or a complaint of default,) as any bonds of the kind in the Union. Yet, from their low rate of interest, (six per cent.,) and from the unstable condition of monetary affairs, occasioned in part, perhaps, by the present war in Europe, the market value of these bonds at this time is about ninety cents to the dollar. Their use, therefore, including the semi-annual interest and discount, costs the company not less than twelve per cent.

If these state bonds, which we all know to be as reliable as any devised scheme of credit can be, are, from want of information of the resources of the state, or from arbitrary controlling influences, reduced from six to ten per cent. under par, what may be expected from individual or company bonds in the present state of the money market?

Experience has shown that without liberal subscription in stock, and large investments in construction, the bonds of Western Railroad Companies, however well secured upon the best real estate, cannot be negotiated except at a great sacrifice. To what extent individual stockholders and corporations can sustain these large discounts in raising money for the construction of railroads, depends upon the prospective profits to be derived from them when completed.

Some roads in the west might stand ten, fifteen, or even twenty per cent., but above these figures the risks become too great, and capitalists shrink from such enterprises. In the west, and particularly in Missouri, the demand for capital for private enterprises is so great that no ordinary rate of interest will divert it from such pursuits. At the same time, it cannot be denied that railroads in Missouri are destined to be as profitable investments as in any other state, and develop to a greater degree its wealth and resources.

By the treasurer's report it will also be seen that the whole amount paid out, including the necessary incidental expenses, amounts to $912,778 68. Of this sum the company is indebted to the state $237,669 05. The balance has been raised from stock, and from such other sources as the credit of the company has enabled them to secure through its Fiscal Agency. This agency is composed of stockholders and directors, who, while they secure the means, are not neglectful of the interest and safety of the company.

The cost of the road, equipped with a single track, according to the original estimates, is nearly six millions three hundred thousand dollars. This estimate was made by Major Bucklin, in strict accordance with the prescribed conditions of a contract which limited

the amount of rolling stock. Additional expenditures will therefore be required for equipment, and its cost may be still further augmented by items of expenditure independent of estimates, and frequently of large amounts, such as arise from financial embarrassments, interruptions, protracted delays, and a subsequent hurried prosecution of the work, of a nature not to be foreseen, and if they were, could not be determined.

If the subsequent estimates of other roads be taken as a criterion, the entire cost of putting this road into successful operation may be assumed at upwards of eight millions of dollars. Of this sum we have about one and a half millions of private stock, and the state loan for the same amount. These taken together, do not exceed one half, and perhaps one third of the amount which may be required to complete and properly equip the road for business. An interesting enquiry here arises. How are we to raise the money to finish our road? We have seen the difficulties which now exist in raising money on the best securities, and the danger of doing so at too great a cost. The state holds a first lien upon the whole road for one and a half millions of dollars. This fact, it is useless to disguise, prevents foreign capitalists from taking additional stock until further inducements are held out by the legislature to insure the construction of the road. At home it can not be expected; for, by reference to the report of the treasurer, it will be seen that the whole amount paid on individual subscription within the limit of the state is only $18,916 80, while there has been paid for right of way $24,267 06.

It is true the company have secured a conditional grant of about 600,000 acres of land of great prospective value, but this valuation is entirely dependent upon the completion of the road. These lands are intrinsically as valuable as other rich lands in the same section of the country, but being interspersed with other lands equally good, and long in market at low prices, surrounded by a large domain of the same quality, at graduated prices from twelve and a half cents to one dollar per acre, I do not hesitate to say that, *at present*, of the lands of the Hannibal and St. Joseph Railroad, or of those on the south-west branch of the Pacific Railroad, not one fifth part of their prospective valuation could be raised; and the lands, together with all the available securities of the companies, could not be hypothecated for money enough to construct one fourth of the roads. I know this to be the result of efforts that have been made for that purpose. We know the agricultural value and mineral resources of these lands, but others do not—they have heard, but do not believe. For the reason above given, the prosecution of the work has been conducted with extreme caution, incurring no debts which could not be promptly paid, and avoiding all those vexatious delays in the payment of dues, which embarrass the whole country, and lead to litigation most fatal to public works.

But with all the prudence and economy on the part of the company, our road stands at this time in need of additional aid from the state to insure its extension to paying points, and its speedy completion. It depends upon the action of the present legislature whether this can be done promptly or not. It must be apparent to every impartial mind, that not only the Hannibal and St. Joseph road but all the roads which have been commenced in this state, require additional aid in order to secure their speedy completion, and in some instances to prevent their final defeat. What that aid shall be, the wisdom of the present legislature must determine. But being compelled to act in the double capacity of a representative of a particular railroad interest, and the representative of the people of my own district in the legislature, and being to some extent responsible to the people of the whole state for any action in so important a matter, I shall take the liberty of presenting what I conceive to be the best plan, without attempting to controvert the opinions of others, or without being so tenacious of the correctness of my own views upon the subject, as not to be ready to co operate most zealously with the friends of any other measure which will accomplish the object we all so ardently desire—the construction of all our roads with safety to the state. There is one plan, however, of constructing works of internal improvement which it is presumed that this state, with the lights of experience before her, can not be induced to adopt; that is, the construction of these works by the state herself.

The management of companies in some of the states has undoubtedly been bad enough, but political management in railroad construction has proved disastrous not only to the works so managed, but to the states themselves, as may be shown by referring to the former condition of Illinois, Indiana, Michigan, and other states. Those states were on the verge of ruin, bankruptcy and repudiation, until they abandoned the idea of creating political engineers, superintendents and contractors to build their roads. Since they have adopted the more prudent method of encouraging individual enterprise to construct their public works, they have not only overcome their former embarrassments occasioned by taking a wrong step at the start, but have, in an incredibly short time, arrived to a most astonishing degree of prosperity and wealth. Many of those roads passing through a country vastly inferior to Missouri, in fertility of soil and in mineral wealth, are now paying from ten to twenty per cent. on their original cost, while the states through which they pass are made rich by the enhanced value of lands and the increased facilities to market.

We might, on the other hand, take the state of Pennsylvania, which is now abandoning the ruinous system of political management, after finding that with a magnificent line of railroads and canals doing an immense business, they did not pay one per cent. on the original cost.

Missouri will not certainly be guilty of the folly of adopting a system which the experience of other states has proved ruinous.

Without entering into an investigation of the various plans which have been proposed, I will give it as my opinion that the one already adopted by the state, of loaning its credit to the companies, retaining a first lien upon the roads for the repayment of principal and interest, combined with a provision for an adequate sinking fund to retire the bonds at maturity, is not only the very best plan that ever has been, but that ever can be devised to aid in the construction of works of public improvement. The embarrassing condition in which the Missouri roads are now placed, is not caused by any defect in the original plan adopted by the state, but is owing principally to the fact that the proposed aid does not go far enough. The loan falls short of half the necessary amount to complete the roads; and yet the first lien held by the state prevents further loans, or subscriptions from the public, which must be obtained, or the roads will be paralyzed or entirely stopped. It is, therefore, evident, that in order to complete the roads under the present system, that the loan of the state must be increased to an extent sufficient to satisfy the stockholders and the public that the amount to be raised by them, together with the state credit, will be sufficient to complete the roads. For it is not to be expected that capitalists will advance their money on a loan which, together with the amount to be advanced by them, will only half build the roads. They must, in advance, have a guarantee on the part of the state of sufficient aid to enable them to complete the roads without being constantly compelled to sue for legislative favors. Without this precaution they might, after expending a large amount of money, find themselves in the same dilemma that now presents itself, from which they could not extricate themselves without sacrifices, which, as prudent business men, they would not voluntarily encounter. No practical man can doubt for a moment that it is for the interest of the state to extend to the railroad companies such aid as will enable them to finish the roads at once, and thus make the expenditure already made, valuable.

Any half-way measure is equally opposed to the interest of the people and companies. The time has come when by some liberal and efficient action on the part of the state the companies ought at once to be put in a condition to build their roads in two, or at least three years. To make a half step now is the sure way of crippling them, and of ultimately making a much greater issue of state credit necessary than would now be required. Any act on the part of the state at this time which provides only half the means to build the roads, renders it certain that the other half can only be raised by the companies, except by submitting to sacrifices that will discourage them and the people of the state from embarking in any railroad enterprise for an indefinite time to come. The very appearance of delay or of financial embarrassment should be cau

tiously avoided. It takes years to overcome the effects of the suspension of works which are in themselves intrinsically good. The reaction in consequence of a failure, leaves the public mind in a worse condition than it was in before the works were commenced. Then comes the day of temporary triumph for the original enemies of the works. The public having been disappointed in its expectations, is, for the time being, disposed to listen to the cry raised by those whose opposition had to be overcome in order to make the first start, who then can exultingly proclaim, that if their opinions had received proper consideration, the works would have never been commenced.

Any one conversant with the railroad history of this country can readily recur to repeated instances of the evil effects of a failure after the construction has been commenced. We can all recollect how the breaking down of the numerous works of internal improvement operated on the public mind after the crash of 1837-'8-'9. Throughout the entire country, every kind of public improvement was dropped, even some that were nearly finished, and the progress of others checked for at least ten years.

Even as late as 1846, under the system of political management, the now great and profitable road, the Michigan Central, was nearly abandoned by the state. One of the wealthiest companies in the United States bought it of the state, and relaid it, but were considered by prudent men as embarking in a wild and hazardous scheme, and their credit for the time being was seriously impaired. The Missouri roads are in danger of the effects of a similar panic and breakdown, without any fault on the part of the companies other than that, perhaps, of making originally entirely too low estimates of the cost of construction. In this aspect of affairs, what ought the state, which is to receive incalculable benefits from their construction, to do? To let these enterprises stop at this time is not only to injure them, but to create a reaction fatal to the best interests of the state, which may never be overcome.

Will she hesitate to afford the necessary aid to build her trunk roads, accommodating every part of the state, and traversing a country of remarkable fertility, when many of the best paying roads in the United States scale or tunnel the most rugged granite mountains, and span the most sterile soil? Yet they have made those states rich and prosperous which have contributed their aid to sustain them while in process of construction. Take for example Massachusetts, which loaned her credit to the first roads constructed within her limits to the amount of two thirds of their entire cost, leaving but one third to be raised by subscription. This was done not only without the loss of a dollar to the state, but with immense advantage to her revenue, elevating her at once to the position she now occupies as a commercial and manufacturing state. The sagacious policy of that state enabled the great designs of the orig-

inators of the system to be accomplished, tested its utility, and supplied the means of constructing other roads without further aid.

Will this state withhold the necessary means for fear of impairing her credit? With a territory of 72,210 square miles, more than equal to the area of New England and a fraction over equal to the area of Massachusetts besides, with all the evidences that the full development of her immense territory would increase her revenues to an amount more than sufficient to pay the interest of the cost of the projected works!

If the state decides that the roads must be built, and it is impolitic for her to undertake their construction, the only alternative left, if the money can not be raised at home, is to hold out the most favorable inducements for foreign capitalists to undertake the works and complete them in the shortest possible time. Under the plan proposed, the state, by retaining the first lien upon the roads, not only has a lien upon the money paid in by the stockholders, but upon the hypothecation or sales of the lands granted by Congress, and the proceeds of her own bonds invested in the roads.

In view of this ample security, the state might well afford to issue her bonds at the rate of two dollars for every one invested by the companies, after the expenditure of the amount already granted. If a failure should be made in the redemption of the bonds at the time prescribed for payment, the chances would be much greater in favor of the state becoming the owner of the roads, if sold after they were completed; as the greater the lien of the state in proportion to the amount of the stock in the roads, the less competition would be encountered by the state, thereby putting it out of the power of individuals or companies however rich, to purchase them for an inadequate consideration.

This system leaves the prosecution of the work (which the state could not safely undertake,) to individuals, while her chances, as before stated, of being fully paid, or becoming the owner if desired, would be greatly increased.

But to all this, it may be urged, that because the Hannibal and St. Joseph Railroad, and the South-west Branch of the Pacific have a donation from Congress, they ought to receive no further support from the state, but ought first to expend all the proceeds of the sale or mortgage of their lands before they ask for further favors from the state.

The reply to this is, that the companies can only sell the lands as the roads are constructed, and until, by active and extended operations throughout their whole extent, confidence in their ultimate completion is created, and the value of the lands thereby enhanced, funds could not be raised by hypothecating all the securities of these companies, sufficient to construct one fourth part of the work; and after thus embarrassing their securities, further negotiations would be rendered impossible.

The statement that a donation of land was made by the state, is not strictly true. The donation was made to the state by Congress for the construction of these two roads; the state acting the part of a trustee, to see that the lands were faithfully applied for the purposes intended. This she has done, and reserved the right to tax the roads as other property, as a consideration for executing the trust. These companies are to pay to Congress a consideration for the lands, by agreeing to transport United States' troops and munitions of war, forever, without charge. They have incurred all the trouble and expense of procuring the land grant, and their location and management; and while the state is the recipient of the accession of revenue and most of the advantages derivable from the construction of the roads, the companies are compelled, also, to bear all the sacrifices necessary to complete them.

The legislation of the state has already been such as to evince a deep sense of the importance of a system of internal improvements, and its special and vital necessity seems undeniable from the fact that the various works in question pass, in their ramifications, through a country probably the most fertile in the world. It abounds in vast but undeveloped mines of valuable minerals, the greater part of which might as well be a barren waste, if the works projected through them are not carried into operation; for lands, however fertile, and mines, however rich, are valueless without the means of transporting their productions to a market.

In illustration of this fact, our attention is forcibly called to the lands of the Illinois Central Railroad, which, before the construction of that road were useless and unavailable, not worth even the price of entry, are now commanding nearly ten times that amount. The alternate sections and lands adjoining, are enhanced in the same proportion; all of which, if assessed at previous rates, would increase the revenue of that state to an extent more than equivalent to the interest on the cost of the work.

These are important facts, and with proper application will go far towards forming a correct opinion as to the beneficial effects to the revenues of this state to be derived from the accomplishment of the projected system of internal improvements now in progress. It is not difficult, I think, to show that its completion will increase the valuation of taxable property to the amount of nearly three hundred millions of dollars upon real estate alone.

Missouri contains forty-six millions of acres, ten millions of which possessing mineral wealth to an incalculable extent, and partly susceptible of cultivation, are now comparatively of no value as a source of revenue. The remaining thirty-six millions, (not including nine millions of cultivated and entered land,) are in the same situation, and likely to remain so.

We may form some estimate of the productive capacity of these lands from the fact that the hemp lands on the route of the Hannibal and St. Joseph Railroad not unfrequently yield twelve to sixteen hundred pounds to the acre; and it is well known that the products of the tobacco lands on the same road, and on the North Missouri Railroad, exceed both in quality and quantity those in any part of the United

States; and that they are not excelled by any in the Western States in the production of wheat, corn, and all the products of the climate. No country can be better adapted to stock raising, and its vast fields of superior coal particularly indicate its future as a manufacturing district.

The latent agricultural capacity of the lands along the routes of the other projected roads is little inferior, and they are unparralleled in mineral deposits. The name of the Iron Mountain Railroad indicates the object of its construction, and is of the highest importance to St. Louis and the whole state. The Pacific Railroad, and the South-west Branch are imperatively necessary to open a communication to the interior, and give value to its agricultural and mineral resources. The indications of lead on the route of the latter in Green, Lawrence, and Newton counties, are such as to warrant the belief that it may be rendered one of the richest mining districts in the United States. At present, being inaccessible to market, it is utterly valueless as a mining country. Another incidental advantage not to be disregarded, is the existence of an extensive plain of salt in the Cherokee country, about one hundred and fifty miles beyond the western terminus. This plain is from one to five miles broad, and fifteen miles long. The deposit is probably of great depth, as it is found in a perfectly solid form, in cliffs within five miles of the salt plain. This region also abounds in fibrous and compact gypsum, and what is singular, in large masses of crystalized gypsum. (Selenite.)

By an extension of this Branch, salt could be delivered in St. Louis at thirty cents per bushel.

It is difficult properly to appreciate the importance to the state of an inexhaustible supply of this great staple at so low a rate; but there can be no doubt that its transportation alone, will be a great and perpetual source of revenue to the road, and will ensure its success.

That Missouri contains within herself the elements of wealth and production to a greater degree than any other region of the same extent in the United States (California not excepted,) no one can doubt who has had an opportunity of making personal observations, and of procuring correct information. All that is required to elicit their real value, is the completion of its projected works. The realization of this important object would fully warrant us in estimating the prospective value of six millions of acres of her mineral lands at fifteen dollars per acre, equal to ninety millions of dollars; of ten millions of acres of entered and uncultivated land, seven dollars per acre, seventy millions of dollars; six millions of cultivated land, at eight dollars, forty-eight millions; twenty millions of uncultivated lands, at four and a half dollars, ninety millions; making a total increased valuation, created alone by the completion of these roads, of two hundred and ninety-eight millions of dollars.

There is nothing unreasonable in the above estimates—nothing but what is in accordance with known results—results which must produce conviction upon any man who is acquainted with what is passing around him, and with the effects of all similar improvements in those states of the Union where they have been consummated.

Let those who doubt that like causes will produce like effects, look at Illinois in our own immediate vicinity, where lands, which previously were of no value, are, as I have before stated, now selling at ten

times the cost of entry, and where, I may add, millions of acres of wild lands are held at from four to twenty dollars per acre; all of which can be ascribed to no other cause than to the railroads now in operation in that state. Virginia, North and South Carolina, Georgia and Tennessee, are analogous instances. Even in our own state, in North Missouri, lands have advanced over one hundred and fifty per cent. within the last year, which advancement is attributable, in a great degree, to the prospective completion of the roads projected in that portion of the state. They have been enhanced probably in other parts of the state, in the same or greater proportion, and from the same cause, which the successful prosecution of these works can alone maintain.

In 1353, the total valuation of taxable property in the state was one hundred and six millions of dollars; and in 1854 it was one hundred and twenty-four millions; showing an increase of seventeen per cent., from causes not connected with the prospective operations of the roads, but with the gradual improvement of the country, and increase of industrial pursuits. Calculated at the same rate of increase, the valuation of property in 1860, will be two hundred and fifty millions of dollars. Add to this the advance as before estimated in the value of lands to be produced by the complete and active operation of the projected roads, and the value of taxable property will be five hundred and forty-eight millions of dollars, yielding a revenue, at the present rate of taxation, independent of that which will be derived from the vast increase of manufacturing, mining and mercantile operations, of one million nine hundred and eleven thousand dollars; an amount exceeding the interest of twenty millions of dollars by seven hundred and eleven thousand dollars, a balance equal to twice the amount of the present current expenses of the state government.

From this exposition, (which can not be considered an exaggerated one,) there is every probability that the rate of taxation will be lessened, and it would seem to be the true policy and interest of the state to pay a bonus of twenty millions of dollars to effect that object, should it be required. But suppose that instead of this, the state loan her credit upon a first mortgage. What is the consequence? The interest must be paid by the companies, or the state will stop the issue of her bonds. And suppose also, that the roads being completed and equipped for business, any company, or all, should fail to pay the interest on the state bonds, the state, of course, would proceed to enforce the payment of such interest as well as principal. This being done, no one, not even the most skeptical, who is acquainted with the country through which the roads pass, can doubt that they could be sold for one half of their cost, say twenty millions of dollars; and even if the state, who could become the owner of them by virtue of her lien, (unless overbid,) suffered them to be sold for ten millions, still she would be more than idemnified by the advantages and increased revenue secured by their construction.

I can not conclude without again urging the necessity of building these roads. Who can deny the utter imbecility and folly of our standing still, and by withholding the right of way across the continent, suffering the advantages within our grasp to be wrested from us, and allowing ourselves to be encompassed by rival improvements passing

on to the Pacific, and diverting our trade from its proper channels? What will be the destiny of the emporium of our state under this condition of things? Without artificial aid, can she sustain her present supremacy, and arrive at that preeminence in commerce, manufactures and wealth, to which she is justly entitled from the extraordinary advantages of her position, and her identification with the commercial and agricultural interests of the whole state?

R. M. STEWART.

HANNIBAL, MO., NOV. 5TH, 1855.

ARTICLE VII.

Literature in the South and West.

In perusing a late number of the *Kaleidoscope*,* we met with a spirited editorial in which the accomplished Editress administers a well merited rebuke to the Southern people for neglecting to encourage and establish among themselves a literature of their own. We should most sincerely rejoice to see southern generosity awakened, and southern chivalry rallying to the support of a lady who has devoted her talents to the publication of a "Family Journal," which in point of true merit is certainly not excelled by any paper of its class, produced north of the Potomac. But when we reflect that almost every individual who ever embarked in a literary enterprise in the Southern or Western States, has, after struggling for years, been literally starved out for want of patronage, we perceive little ground to hope that even the accomplished Editress of the *Kaleidoscope* will obtain the sympathy and support of the Southern people.

A few instances will show how little can be expected from southern patronage. The Southern Quarterly Review, a work most ably conducted, after struggling for existence through a period of many years, was finally transferred to Baltimore. The Southern Literary Messenger, always distinguished for its high moral tone, and its chaste and interesting matter, declared recently, when about to close its twenty-first volume, that its publication must cease,

* To those of our readers who may not have met with this interesting paper we beg to say that it is "A Family Journal devoted to Literature, Temperance, and Education," edited by Mrs. R. B. Hicks, Petersburg, Va., published monthly, at one dollar a year, in advance.

unless a more generous support could be obtained.* De Bow's Review, a work of no ordinary merit, conducted by an influential individual of acknowledged ability, is now published north of the Potomac, though it still has a nominal existence at New Orleans; and of the great number of literary papers and periodicals which have been established in the South and West within the last ten years, but few remain in existence to tell the story of their unrequited labors. Political newspapers, supported chiefly by an advertising patronage, is the only class of literature which receives sufficient encouragement to sustain existence in the South and West.

What is the cause of this? Are the people of the Southern and Western States willing to stultify themselves by admitting that they have neither talents nor taste in their midst, or, that these regions are uncongenial to the production of a solid and a refined literature? Many may entertain these opinions; but we must look elsewhere for the cause: Literature follows the currents of commerce, and clusters around its principal centers. In this country, "Commerce is king," and when its imperial capital was established in the East, the Southern and Western States became provinces of its empire; and manufacturing industry, the fine arts, and literature were all drawn to, and around the seat of its regal power.

It is folly to expect that the people of the South and West can ever have a literature of their own so long as they remain the passive and unresisting tributaries of the present monopolizing system of commerce. Let them build up commercial and producing cities of their own, shake off their vassalage to the East, and establish direct commercial relations with foreign countries, and literature will spring up and flourish in their midst as a natural consequence. In the meantime, it is the duty of all who desire this state of things to countenance and encourage those who labor for its consummation.

No people ever obtained a place in the first rank of civilized nations without a literature of their own: such a thing is impossible, and never can occur. If the southern and western people are content that the taste, morals, and philosophy of their families shall be formed and directed by eastern scribblers and publishers, whose highest and only aim is the attainment of money, be it so; but if they possess any ambition to excel or even a desire to be equal to

* We are gratified to learn from the December No. of this excellent work that it will be continued and enlarged.

other civilized communities, they must encourage the development of mind in their midst, and build up a literature of their own, whose chief aim shall be to enlighten, elevate, enrich and adorn them as a people.

This subject having been suggested by the *Kaleidoscope*, we trust we shall not offend its amiable editress by transfering her spirited criticism on the conduct of the Southern people to our pages.

SOUTHERN LITERATURE.

Literature, South of Mason and Dixon's line, is in a forlorn condition. Southern men look coldly upon Southern talent, and Northern enterprise comes with its puff and rhodomontade, and gathers up the loaves and fishes from under our very eyes. All this may be owing to our "peculiar institutions," as the Yankees sneeringly insinuate, and if so, it must be a very *peculiar* institution indeed, so peculiar that we are at a loss to understand its idiosyncrasies, or in any way to compete with its peculiarities.

In fact the sunny South is an enigma. It is as gentle a clime as ever poet rhymed in, but as variable "as the shade by the light quivering aspen made," It is kind and generous to a fault, but it is not kind judiciously, or generous conscientiously. Its best poets starve, and its own interests are disregarded. It is a freakish, fickle land, and is not to be trusted, even by those whole-souled, impulsive geniuses, who throw themselves upon the mercy of a people, whose kindness is proverbial. This beautiful land of ours has indeed

> "A tear for pity, and a hand
> Open as day to melting charity,
> Yet, notwithstanding being incensed, 'tis flint;
> As humorous as winter, and as sudden
> As flaws congealed in the spring of day.
> Its temper, therefore, must be well observed.
> Chide it for faults, but do it reverently,
> When we perceive its blood inclined to mirth;
> But being moody, give it time and scope,
> Till its great passions, like a whale on ground,
> Confound themselves with working."

It is proud, extravagant, impulsive and variable; and if it acted as well as it can talk, its poets would reap a harvest. Southern patriotism consists in big speeches, made at festive boards, and at the popping bottle's mouth. Southern chivalry consists in bows, polkas, glasses of wine, and its highest feat, in drinking the fair one's health. Southern generosity shows itself during LIND manias, KOSSUTH manias, and upon great public demonstrations. Southern courage flinches not at the bowie knife, and prides itself upon its deportment within six paces of a revolver, but it allows its

negroes to be kidnapped, and its wealth to flow into other hands. Southern enterprise is taken in hand by Northern houses, which sell brooms to a man who has a plantation covered with broom-straw, and cowhides, and brogans to the land-holder, whose cattle feed upon a hundred hills.

In short, it is all smoke and no fire, with Southerners. Nothing but fuss and feathers, and strutting and bragging, and a contempt for all that is useful, with no real appreciation of all that is beautiful. A Southern gentleman considers it much more gentlemanly to exercise his arms, and expand his chest, by dumb-bells and billiards, than by the axe or the woodsaw. All this is no more owing to our "peculiar institution," than it is to the gulf stream. Negro slavery has about as much to do with this state of things, as the Aurora Borealis. *Public opinion* is the tyrant of the South—and public opinion, more than any institution, keeps down Southern enterprise and individual talent. Public opinion makes it ungentlemanly to shoulder an axe, or unladylike to use a pen. Public opinion allows a lady to go to a ball in mid-winter, with shoulders, chest and arms entirely exposed, and says not a word, but if she covers her neck, and writes for a newspaper, hanging is too good for her! Public opinion allows a gentleman to keep a horse when he is not able, go in debt beyond any hope of payment, gamble, race, smoke and bet — but if he takes a basket on his arm, or a hatchet in his hand, he is gone!

Well, brother editors, and sister editresses, all we have got to do, in self-defence, is to attack this tyrant, Public Opinion. Go right at him with your pens, and spear him with your barbed steels. Down with him, for he is menacing, not only Southern enterprise —but Southern happiness. Who is he, that he should say a lady has no use for her talents—or a woman for a means of livelihood? Who is he, that he should promulgate his foolish dicta, in opposition to reason and common sense? Who is he, that he should deride an honest old maid, and uphold the ruinous follies of the heartless woman of fashion? Who is he, that he should strangle our Literature, and put to death the poet who dares to raise his melancholy voice? Down with him, for he has no right to rule over us. His morals are based upon appearances—his laws are founded upon the lowest pride of men—and his dicta defy both reason and common sense. Down with him—for only fools obey him—and a motly crew dance attendance at his court. Down with him, and instead of the sceptre and the crown, give him what he should have worn long ago—a cap and bells!

DEPARTMENT OF INDUSTRY.

Manufactures of Iron in St. Louis.

A far-sighted policy is required, in order to build quickly a solid and complete establishment of manufacturing interests in the city of St. Louis. A near-sighted policy strangles these interests in their first struggle for existence.

In a new country, *land* is the first object in which capital is invested; and the agricultural interests, as is natural and proper, swell into vast proportions: then cities arise; and, from the immediate necessity of the agricultural interests, commerce is established: merchants invest their funds in the products of the soil, send these products, with heavy costs attending them, to foreign ports, there exchange them for dry-goods, hardware and other manufactures, which, with heavy costs attending them, are brought back, and sold to the farmers. The farmers get along by the sale of their products, foreigners are favored by the sale of their manufactures, and the merchants protect themselves by their profits and commissions; and to give facilities to merchants, whereby they are aided in paying the farmers and foreigners, banks are established.

Thus a system is formed, and habits are formed with the system, to keep the capital of the new country invested in these half home, half strange interests,—in domestic breadstuffs and foreign merchandize—varied by a frequently dangerous and occasionally fatal fever in land speculations.

Looking at this system in operation, a near-sighted policy, absorbed in making the most money in the shortest time, in spite of future blighting consequences, maintains the speculating spirit of the day in breadstuffs, foreign wares and wild lands, and stifles every effort to form at once a solid and complete establishment of domestic manufactures.

Looking at the modification and improvement of this system, a far-sighted policy, with comprehensive views, sees that, while a few men are making some money on the short run, the whole country is loosing money on the long run.

Thousands of tons of railroad iron are brought from England to U. S., and millions of dollars of gold are sent from U. S. to England.

Missouri requires 120,000 tons of iron rails for the 1,200 miles of her main, leading, trunk system of railroads. At $75 per ton, this item amounts to $9,000,000.

While a few men are making money in buying these 120,000 tons of iron in a foreign land, do not the people of the State of Missouri eventually loose the whole $9,000,000, as, when this foreign iron is paid for, the money is taken away from the country, and would not these $9,000,000 be wholly saved for the people of Missouri, by a domestic production of these 120,000 tons of iron rails, as, when this domestic iron is paid for, the money paid is kept in the country.

The coal and the ore for the manufacture of these rails are at hand, within a few miles of the city of St. Louis; but the people, being confirmed in the habit of farming and mercantile business, and blind to the advantages to be derived by building up a complete domestic manufacturing business, seem to prefer the final loss of these $9,000,000 rather than allow the manufacturers of Missouri to save these nine and various other tens of million dollars to circulate at home, ringing with their silver and golden tones on the public ear, stopping the dismal daily cry of "Hard Times," and opening the joyous day of the "Good Times Coming."

In order to realize this change, liberal banking facilities should be granted; the tax on machinery and industry removed; a spirit of earnest and energetic co-operation aroused, and capital freely invested in the cause of manufactures.

The absolute law of interest on money is now modified; and after the 1st of January, 1856, contracts for money at 10 per cent. interest will be legal. This law will draw capital.

The Iron Mountain Railroad is to be completed, according to contract, on the 1st of December, 1856. The furnaces and factories for making all the railroad iron needed by Missouri should be built and ready for operations on the opening of the railroad to the Iron Mountain Region. In the various kinds of manufacture of glass and china wares, of lead and copper, wood and marble, hemp and tobacco, wool and cotton goods and merchandize, millions of dollars should be immediately invited for investment, with liberal, legal inducements.

The farmers and merchants of Missouri would then see the good times coming to them, as well as to their less lucky fellow men—the mechanics of the land:—for the more mechanics there are, and

the better they are paid, the more will they buy of breadstuffs, goods, wares and merchandize; and the surplus of breadstuffs and the surplus of manufactures produced in Missouri, the merchants can sell to foreign lands, and in exchange bring back the money which the people have heretofore been loosing, and binding themselves in order to borrow it back on bonds.

Thus Missouri can easily gain the money to buy up all her bonds and establish a material independence of England and of every foreign land, and having a superabundance of all the good things of earth, her real estate will rise in real value, and her farmers may become patriarchs and her merchants princes in lives of civil refinement and of religious beneficience.

We have heretofore, in May, 1854, vol. 12, page 118, of the Western Journal & Civilian, and on various other occasions, indicated the principles and plan by which the bonds of the State of Missouri could be all retained at home and raised in value, and their proceeds safely used, as a sound currency, among the people.

The adoption of this system of finance—that of individual banking on the State bonds, with strong guards requiring each note issued to be promptly redeemed by gold and silver, would soon raise Missouri credit above par like that of Ohio and New York.

The $17,000,000 of bonds now provided by the State for the Railroad Companies would soon be absorbed in domestic industry, and by developing the internal resources of the State, the superabundance of the products of the soils, mines and factories, over domestic wants, could be sold to other lands, and gold and silver enough brought back in exchange to meet all these bonds long before their maturity.

The removal of tax from machinery and industry, together with other means of promoting the manufacturing interests of St. Louis, we hope to discuss more fully on another occasion.

At present, we will show more fully than heretofore, various items connected with the amount and character of business done in the manufacture of iron in the city of St. Louis. The principal houses engaged in this industrial pursuit are as follows:

Gaty, McCune & Co., Mississippi Foundry.
Kingsland & Cuddy, Broadway Foundry.
Clark, Renfrew & Co., Eagle Foundry.
Kingsland & Ferguson, Phoenix Foundry.
Dowdall, Carr & Co., Washington Foundry.

Bridge & Bro., Empire Stove Works.
Giles F. Filley, Excelsior Stove Works.
D. M. Hitchcock & Co., Stove and Plough Foundry.
Wm. Haslett, Mechanics Stove Foundry.
Palm & Robertson, Locomotive Iron Works.
Edward Boyle, O'Sullivan Iron Works.
W. H. Card & Co., Boiler and Sheet Iron Works.
Grey & Clark, Missouri Rolling Mill.
Stewart, Parks & Co., Allen Iron Works.
Wm. Clark, People's Works Foundry and Machine Shop.
Ross & Gillum, Vulcan Iron Works.
Branch, Crookes & Frost, St. Louis Saw Works.
W. L. F. Gage & Co., Empire Saw Works.
McCords & Beck, Franklin Foundry.
James Graham & Co., Foundry.
F. Gelfort & Co., St. Louis Novelty Works.
C. & T. R. Pullis, Mississippi Iron Works.
McMurray, Clark & Co., St. Louis Iron Railing Foundry.
M. Pawley, Sup't., Ornamental Iron Railing Works.
Jas. L. Gage, Missouri Foundry.
J. H. Singleton & Co., Pacific Foundry.
Frank Hardesty, Iron Mountain Foundry.
Timmermann & Fisher, Machine Shop.
R. H. Cole, Nut, Washer and Machine Shop.
T. B. Ellis, Missouri Boiler and Sheet Iron Works.

About ten of these houses commenced business in the year 1855. The history of each, we hope to publish more minutely in future numbers.

The Mississippi Foundry was established first, the Broadway Foundry second, and the Eagle Foundry third. The Phœnix and Washington Foundries and the Empire and Excelsior Stove Works went into operation between 1840 and 1850, and the Missouri Rolling Mill and Allen Iron Works in 1855.

These nine establishments are among the largest iron manufactories of St. Louis. The amount of their capital invested is about $1,500,000, and their yearly products amount to over $2,500,000, one half the amount of iron works produced in St. Louis: the total amount of capital in the city invested in this business being about $3,000,000, and the total yearly produce of its iron manufactures $5,000,000.

The Locomotive Iron Works of Palm & Robertson are superior in capacity to many of the above establishments, although the

amount of their products has not equalled their capacities. This establishment is situated on the west side of Third street, and on both sides of Lombard and on both sides of Hazel streets. The width of their grounds on Third street is 500 feet, and their depth averages 150 feet, making an area of 75,000 feet of ground occupied in this business; and more than an acre of this ground is under roof.

The amount of their capital invested in grounds, improvements, fixtures, patterns, tools, stock and unfinished work on hand, in December, 1855, seemed really worth $200,000.

They have been engaged building locomotives for the Pacific, the Ohio & Mississippi, the North Missouri, and the St. Louis & Iron Mountain Railroads; and on the 9th of November, 1855, they received an order for two first class locomotives, of 24 tons each, and each at the price of $9,800, from the Keokuk, Mt. Pleasant & Muscatine R. R. Co.: the first locomotive to be delivered on ship board at St. Louis on the 15th of April, 1856, and the other on the 20th of June, 1856: — the first one to be named J. K. Hornish.

This Locomotive Establishment must be of great importance to the Railroad Companies in the States bordering on the Mississippi, on account of its convenience for repairing their old engines, and for furnishing them with new ones; and although some sacrifices may be endured by its enterprising proprietors at first, we trust that in the end they may realize rich satisfaction,—that in a short time, orders will be sent to this house, in numbers beyond its capacity, from various Railroad Companies in Iowa, Wisconsin and Louisiana, and from those of every State intervening on both sides of the Mississippi, and that, in another year, it may turn out $300,000 worth of works.

The O'Sullivan Iron Works, which received this name in December, 1855, were started in the preceding February, as an establishment for the manufacture of Boiler and Sheet Iron Works; but during the year enlargements were made in the character of the works, and, by an economical arrangement in the disposition of a modest piece of ground, by the industrious and energetic proprietor, Edward Boyle, in the unassuming space of 100 feet on the east side of Main street, by 150 feet on the north side of Cherry street, making an area of only 15,000 square feet, the engine, boilers, furnaces, machines, &c., are of such a nature, and so ad-

justed, as to gain the capacity of turning out steamboat and railroad iron works, as we are credibly informed, to the astonishing amount of $500,000 worth a year; and if even one half of this amount is realized, it will be an honorable result for this enterprising house.

At times, 60 workmen have been employed in this establishment, during 1855, mainly in boiler and sheet iron works, and their weekly wages have amounted to $500,00, and the weekly products to $2,500 worth of boilers and $400 worth of sheet iron and other ordinary works; at which rate, the wages would be over $25,000 and the products about $150,000 a year.

The addition of the railroad iron department to this establishment consists of two furnaces and two machines: one of each for the manufacture of railroad chairs, and one of each for the manufacture of railroad spikes. The chair machine has turned out 14,000 pounds in 24 hours—7 tons a day—its capacity being rated at 8 tons a day. The value of railroad chairs is from $90 to $100 a ton. During the season Mr. Boyle filled a small order of 14 tons of railroad chairs for the Callaway Mining & Manufacturing Co. at $100 a ton; and orders are now on hand for chairs to be used on the Ohio & Mississippi and Missouri Railroads.

The capacity of the spike machine is said to equal 5 tons in 24 hours. Value of spikes, $100 a ton.

A rivet machine, for the purpose of making boiler rivets, has lately been purchased by Mr. Boyle; it is expected to be in operation early in January, 1856, with an additional furnace already built, whose capacity for turning out boiler rivets is estimated at 5 tons in 24 hours. Value of boiler rivets $130 a ton.

These three furnaces, and these three machines for making railroad chairs and spikes and boiler rivets—if their total capacity averaged only 15 instead of 18 tons a day, and the total value of their products averaged only $100 instead of nearly $110 a ton—these three furnaces—on this reduced estimate of their capacity would turn out yearly $450,000 worth of works; but reducing this yearly estimate $100,000 further, by allowing for loss of time in making repairs of furnaces, machines, &c., their yearly capacity would then be $350,000, which amount added to that of the boiler and sheet iron business, $150,000, makes the yearly capacity of the O'Sullivan Iron Works $500,000.

Numerous and valuable items already collected about the various

other iron establishments in St. Louis—about the nail, saw, safe, nut, scale, bedsted, ornamental railing and other foundry and steamboat and railroad iron works—must be defered to another occasion.

There is, however, one item that is too valuable to be now omitted, and this is that the Eagle Foundry pays nearly $100,000 a year to workmen.

If the other iron establishments of St. Louis, above enumerated, pay on an average one third of this sum, their yearly amount paid workmen would be more than $1,000,000.

This is only a small portion of the money saved every year in St. Louis, by virtue of her domestic manufactures; because her manufactures of various other articles besides those of iron are very extensive, though they should be greatly enlarged; and because there are a multitude of other items, besides that of cash paid workmen, by which money is saved at home; and because all this money would be drained away and enrich other lands, if these industrial pursuits were excluded from Missouri.

And as it is thus seen that the mechanics must prosper by virtue of domestic manufactures, so also it can be distinctly shown that professional men and landlords, miners, farmers, merchants and bankers, must prosper by the money flowing through the hands of the manufacturers and mechanics into the pockets of the people throughout the State, as above foreshadowed.

A FAREWELL.

BY VALERIA.

1.

'Tis hard to bid thee go, Love—
To hear thy parting tread,
And miss the dear, accustomed place
To stay my sinking head:
Soon, many weary leagues, Love,
Will lie between our hearts;
It is no little thing, when space
Such close existence parts.

2.

'Tis hard to bid thee go, Love,
When I would have thee here;
E'en sorrow looses half its pain,
In knowing thou art near;
And death has been within our home,
And closer drawn the tie
By joy first wove—in holier bonds
Of stronger sympathy.

3.

'Tis hard to bid thee go, Love,
When most I wish thy stay;
Our bridal day is dawning fast,
But thou must haste away—
And I must sit alone, and muse
Upon that dearest time,
When God first gave thee to my heart,
In manhood's opening prime.

4.

But I cannot bid thee stay, Love,
From such a call as thine,
Nor shake the heart, that should be strong,
By the throbbing pulse of mine.
Oh no! I will not strive to keep
Thee, weakly by my side,
Just as thy mind is carving out
Its honest path of pride—
Just as my country calls thee forth
To join her high debate,
And bids thee take thy rightful place
Amid her wise and great.

5.

And oh! when thought shall flood thy brain,
And genius light thine eye,
And eloquence shall lend thy lips
A poet's ecstacy—
Forget not in that hour, but still
Look upward to the shrine,
Whence came these glorious gifts to thee,
And say, "The praise be Thine!"

6.

Oh! think, too, on a far off heart,
Whose deepest wave is stirr'd,
When with thy name, some thrilling tale
Of lofty deed is heard—
Who pines to catch thy lightest word,
Or feel thy soft caress,
And never breathes thy name, but comes
The quick desire to bless.

7.

And when at vesper hour, thy strength
Of manhood comes to bow,
All humbly at the mercy seat
To bare thy lofty brow;
Knowing, the Spirit-worshipper
Can never ask in vain,
With earnest prayer, plead with him then,
That we may meet again.

MISSOURI.